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THE BALD EAGLE - HUNTER OR SCAVENGER?

by Dick Dekker
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In the oft-quoted opinion of Benjamin Franklin, the Bald Eagle was not worthy of being the national emblem of the United States, because it was "a bird of bad moral character. . .who does not get his living honestly". This sentiment was shared by A.C.Bent, author of a classical work on raptors titled "Life Histories of North American Birds of Prey". In his words, the Bald Eagle was a fine-looking bird, but one hardly worthy of distinction because of "its carrion-feeding habits and predatory attacks on the smaller and weaker Osprey" from which it steals fish. Bent considered the Golden Eagle a "far nobler bird" because it hunts and secures its own prey.

At the risk of appearing to disagree with both of these distinguished gentlemen, I submit that acts of piracy are a fact of life and an occasional source of income to all predatory birds; I witnessed numerous examples of inter- and intra-specific theft by eleven species of raptors, among them the "noble" Golden Eagle and the greatest hunter of all, the Peregrine Falcon.

The Bald Eagle's carrion-feeding habits cannot be denied. It regularly eats dead fish and utilizes the most putrid carcasses of farm animals in areas abounding in potential prey such as ground squirrels and waterfowl. However, before concluding that this eagle lacks the "noble" qualities to catch live food and is therefore forced to resort to carrion, we should do some more observation. The Bald Eagle may be a lazy bird but if no free lunches are available, it is quite willing and capable of working for a living. Its relationship to waterfowl is a complex one, but not one to be ashamed of.

The shores of Beaverhill Lake and other shallow prairie lakes, that contain no fish larger than sticklebacks, are good places for eagle study, especially during spring and fall when countless migrating ducks and geese gather. At the approach of a Bald Eagle, nearly all waterfowl take to the air, a sight that never fails to impress. The eagle stands out because of its isolation; it alone moves individually on a steady course in a sky that fills with fleeing ducks and geese. But the danger of a high-flying Bald Eagle is almost nil; usually it leaves as it came, winging steadily or soaring to gain altitude before continuing its travels.

A few eagles are tempted to linger at the lake, attracted by the huge number of birds. They plane down to the water's edge and sit for hours. Half a dozen may join in a loose gathering, sharing the tantalizing view of all that potential food. Some of the ducks and geese descend nearby and approach the resting eagles closely, but as soon as one of them unfolds its huge wings, the fowl scatter. The degree of their caution varies; on cold cloudy days, in spring as well as in fall, when there is little open water and the ducks are massed in tight rafts, they can be quite reluctant to flee. Only those directly in line with the eagle's low approach leave the water. The so-called diving ducks, such as scaup and goldeneyes that find their food by swimming under water, frequently refrain from flushing altogether and will submerge if an eagle gets too close.

In early November, after most waterfowl have left and those that remain are concentrated in patches of open water, their tolerance of eagles is even greater. These last ducks may be a scruffy lot. If the ice is strong enough to walk on, you can approach these holes. Most birds will flee but several will show damaged wing feathers, most likely caused by gunshot. You would probably find the remains of eaten ducks scattered on the ice, surrounded by splotches of white excrement as proof of the eagle's involvement. In snow, you may locate its crooked tracks and the paired imprints of its wing tips. If weather conditions are calm, a low take-off can leave a long series

of pinion tracks that look like the touch of a giant's hand.

The water holes are usually attended by several eagles that roost in large trees in the neighbourhood and come to the ice when hungry. They seldom seem in a hurry to catch their duck. When launching a raid, they fly low over the ice, their speed deceptive and greater than it seems, particularly when the powerful birds exert themselves and increase the tempo of their wingbeats. The final attack may be no more than a harmless sally over the ducks, which dive with vigorous splashing, but if one of them underestimates the potential peril and hesitates to get out of the way, it will be seized in an instant.

Perhaps most ducks that get caught are in a poor state of health, either injured, sick or starving, but that is not always the case. One Mallard that I saw end up in the eagle's clutches made an error in judgement; it left the hole well ahead of the large bird's approach, but returned to the water too soon, just after the danger seemed to have passed. The eagle swooped upward, a stalling, and curved back to the duck in a split second, lifting it onto the ice.

A Lesser Scaup drake didn't react quickly enough. With others of his kind, he had been resting on the ice when the eagle came. All ran hurriedly to the hole, the drake the last one to leave. Just as he reached the security of the water and was ready to dive, the eagle veered toward him and snatched him up in one foot.

Ducks that climb out of the water and stand on the ice seldom have to wait long before a hungry eagle launches an attack, although they will nearly always be safely back in the hole before the eagle has a chance. To the observer, these repeated futile attacks seem rather pointless, but the eagle probably knows that injured or sick waterfowl are the first to leave the water. Some flightless ducks that cannot find adequate food supplies in the hole will start out on foot to the shore. I have seen some, too weak to walk, that pushed themselves over the smooth ice, sliding on their belly. The eagle that flies up is an angel of mercy.

After the eagles have weeded out the lame and sick, the holes contain only healthy diving ducks and some alert Mallards that for some reason are not yet ready to migrate. Their tireless milling prevents the ice from closing in, but the holes become smaller by the day. As long as some water remains, the ducks will stay and so do some eagles. New arrivals come in from the north and collect on the lake. During migration, Bald Eagles possess a degree of sociability, and an unique system of sharing food. If one catches a duck, it's seldom long before another eagle takes it away, to be robbed in turn by a third and so on. As well as feeding on each other's kills, they also hunt together.

One day, two immature eagles had cornered a Mallard in a water hole and were hovering over it, side by side. Whenever one of them swooped at the duck, it dived with a splash and remained underwater for a while, emerging some distance away. An adult eagle saw the action from afar and flew up. It, too, hovered over the duck for a moment, then sailed to the ice and sat down to watch. The two immatures continued their hunt, and one of them, a bird with much cream colour on its belly and in the tail, suddenly plunged into the water. Wings spread, it lay on the surface for a few moments, until it lifted off laboriously, holding the duck in its feet. Alighting on the edge of the ice with its catch, it was immediately set upon by the adult. During a brief struggle, the duck escaped into the water and swam away while the three eagles just stood and looked. Before long, the two immatures sprang to the air again and took up their positions over the hole, facing into the brisk wind, flapping their great wings slowly. Probably, they could see the diving duck underwater. The cream-coloured immature splashed down and rose a few seconds later, holding the duck, but he lost it for the second time as a results of an aerial pass by the other eagle. After a rest, the cream-coloured immature again caught the duck by plunging into the hole. This time it stayed on the surface much longer and had difficultly becoming airborne, going down upon the water twice before reaching the ice. Intimidated by the approaching adult, it let go of the duck which

was weakly flapping one wing. The adult eagle seized the prey in its great yellow feet and began to pluck, duck feathers sliding downwind along the ice. The young eagles looked on and fought over the remains.

The day after I had witnessed the above, I again saw the cream-coloured immature capture a submerged duck. The eagle lay on the water for several minutes before finally swimming with thrashing wings to the edge of the hole. It managed to get on the ice with one foot, the other holding the duck. Assisting with its bill, the eagle lifted its prey out of the water. The duck seemed lifeless and probably drowned as a result of the eagle's prolonged stay on the water.

Only rarely have I seen adult eagles hover and plunge belly-deep into water to capture submerged ducks. It seems that they prefer to snatch them from the surface. Flying around the diving duck, they swoop when it comes up for air. After one or two tries, they usually give up and plane back to the ice, but if hungry enough, the eagles will keep at it until successful. They may even pursue flying ducks and are capable of seizing them in the air. One day I saw an adult eagle fly over the lake, at an altitude of about twenty metres, when it suddenly plunged and overtook a rising Mallard that narrowly escaped by turning abruptly. Another adult actually succeeded in seizing a fleeing duck low over ice, but fumbled its grip when a second eagle swooped at it. Both eagles pursued the duck that dodged several passes and finally reached safety in between trees.

Observations such as the above prove that the Bald Eagle is a hunter, albeit a lazy one, and not merely a scavenger. Its relationship with waterfowl appears to be a selective one; it applies a steady pressure to which the sick and the unwise are the first to succumb. In cases where it would be necessary to defend the role of predatory birds in nature's scheme, no better example could be found than this splendid creature. Therefore, I respectfully submit that the American Bald Eagle is a bird of which the honourable Benjamin Franklin should have been rightly proud.

UNUSUAL AVIAN OBSERVATIONS FOR THE FORT MCMURRAY, ALBERTA AREA, 1976 - 1982

by John R. Gulley
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I have had the opportunity to be able to conduct fairly extensive avian surveys in an area just north of Fort McMurray, Alberta, during the years 1976-1982. The observation sites are all found within an area of 3091 ha some 30 km north of the city. Surveys were conducted at up to 18 different sites and total observation periods number 11860 since 1976.

To date a total of 210 species have been recorded in the survey area. Thirty of these species are unusual because they are rare within Alberta or they are not normally found in the Fort McMurray area. The location of Fort McMurray is such that birds from up to four migratory flyways (Pacific, central, Mississippi and Atlantic) may pass over the area. This fact coupled with the development of different habitat areas at industrial plants north of the city have contributed to an increased probability for unusual avian sightings. The following list presents these species and details the sighting records for them.

1. Arctic Loon - 1 bird on October 5, 1977
2. Red-throated Loon - 4 birds on May 10, 1977
3. Western Grebe - 20 individuals sighted during 13 observation periods between May 10

and June 12, 1979

4. Eared Grebe - a breeding colony was established in 1980 - a colony of about 50 pairs in 1981 and 1982
5. American Black Duck - 12 sightings of a lone male between May 13 and July 18, 1980; 1 sighting of a male on May 12, 1981
6. Gadwall - substantial increases in numbers between 1976 and 1981 - 1976, 22 individuals sighted during 15 observation periods; 1981 - 3381 individuals sighted during 118 observation periods. Nesting confirmed during 1981 and 1982.
7. Cinnamon Teal - 1 sighting of a lone male on June 19, 1979; 14 birds sighted during 7 observation periods between May 5 and May 30, 1981, at least 2 males and 1 female present
8. Wood Duck - 1 sighting of a lone male on May 18, 1977; 1 sighting of a pair on April 26, 1981
9. Barrow's Goldeneye - 1 sighting of a pair on April 19, 1978
10. Harlequin Duck - 2 sightings of 2 birds (a female and a juvenile) on October 1 and 3, 1981
11. Hooded Merganser - 1 sighting of 2 birds on May 19, 1977; 1 sighting of 1 bird on May 18, 1979; 11 birds sighted during 6 observation periods between May 23 and September 12, 1980; 1 sighting of 2 birds on June 9, 1981; 1 sighting of 1 bird on June 18, 1982
12. Cooper's Hawk - 1 sighting of 1 bird on May 8, 1976; 2 sightings of single birds on September 4 and 7, 1980; 4 birds sighted during 3 observation periods between May 22 and May 29, 1982
13. Broad-winged Hawk - 1 sighting of a single bird on May 29, 1977 and May 30, 1981; numerous sightings of this species were made by local birdwatchers in Fort McMurray during the spring of 1982
14. Peregrine Falcon - sightings of single birds on April 29, 1977; May 23, 1978; May 31, 1979; April 20, September 22 and October 1, 1980; May 8, 1981; and May 8, 1982
15. Whimbrel - sightings of single birds on May 30 and August 24, 1980; 2 birds sighted on May 23, 1982
16. Willet - 1 bird sighted on May 25, 1976; 4 birds sighted on July 14, 1980
17. American Avocet - 2 birds sighted on May 2 and May 6, 1977; 7 individuals sighted during 4 observation periods between May 8 and June 24, 1980; 8 individuals sighted during 3 observation periods between April 28 and May 6, 1981; 2 birds sighted on May 29, 1982
18. Red Phalarope - 1 male sighted on June 3, 1982
19. Glaucous Gull - 1 individual sighted on May 16, 1977; single birds sighted on April 29, May 6 and May 24, 1978; single birds sighted 11 times between April 26 and June 1, 1979; 4 single birds and 1 sighting of 2 birds between May 30 and October 21, 1980; single birds sighted 17 times between May 2 and September 19, 1981, plus one very late sighting of a single bird on November 26, 1981; single birds sighted 3 times between June 6 and June 9, 1982
20. Mew Gull - 1 sighting of 6 birds on July 16, 1977; 47 individuals observed during 8 observation periods between April 30 and May 16, 1978; 50 individuals counted during 7 observation periods between May 8 and August 2, 1979; 2 sightings of lone birds, April 17 and August 19, 1980; 23 individuals counted during 5 observation periods between May 8 and 15, 1981; 50 individuals counted during 5 observation periods between May 11 and 16, 1982
21. Caspian Tern - 1 observation of an adult bird on June 20, 1976
22. Mourning Dove - single bird sighted on June 20, 1976; May 23 and 28, 1978; 1 bird on May 25 and 2 birds on May 30, 1979; 1 bird on August 10 and 2 birds onMay 19, 1980; single birds on May 13 and October 15, 1981; single birds on May 26, June 2 and 21, 1982

23 Say's Phoebe - 3 sightings of 1 bird between May 12 and August 2, 1976; 2 sightings of 1 bird between May 9 and 13, 1977; 2 sightings of 1 bird between May 3 and 4, 1978; 2 sightings of 1 bird and 1 sighting of 2 birds between May 8 and August 17, 1980; 1 sighting of 1 bird on August 12, 1981; 4 birds sighted during 3 observation

periods between May 3 and 11, 1982
24. Black-billed Magpie - 2 sightings in 1976, but during 1981, 103 individuals were recorded during 39 observation periods between January 22 and October 14; in 1982 at least 3 nesting sites established, and 540 individuals were recorded during 154 observation periods between April 6 and October 28
25. Brown Thrasher - 1 bird sighted June 9, 1980
26. Bobolink - 2 sightings of lone males, 1 possible on May 21 and 1 confirmed on May 25, 1980
27. Connecticut Warbler - 18 sightings of a lone male between May 30 and June 28, 1982
28. Western Meadowlark - 5 individuals sighted during 3 observation periods between June 1 and June 3, 1976; 20 individuals sighted during 19 observation periods between May 2 and July 21, 1977; 1 bird sighted on May 25, 1980; 1 bird sighted May 23 and 24, 1982
29. Northern Oriole - 1 sighting of a male on June 12, 1980; and June 3, 1981; 2 sightings of lone males on July 2 and 6, 1982
30. American Goldfinch - 1 bird sighted August 3, 1976; 9 individual sighted during 4 observation periods between June 6 and July 18, 1977

A GRIZZLY BEAR, WOLVERINE AND ELK INTERACTION

by Howard F. Coneybeare
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Only rarely is a naturalist fortunate enough to observe large mammals interacting in a wild setting. On 16 and 17 June 1979, I had such an opportunity while working for the Canadian Wildlife Service in the Clearwater Valley, 0.5 km southwest of Clearwater Lake in Banff National Park.

OBSERVATIONS

At 0910 two large dark animals were spotted moving along the far side of a wet, valley bottom meadow. Scrutiny with binoculars revealed two grizzly cubs (2nd year) accompanied by a sow, moving up the river valley approximately 500 m from me. Their movement along the edge of a willow-dwarf birch-sedge meadow, bordered by a subalpine fir-Englemann spruce forest, was casual and punctuated by frequent stops apparently to feed on vegetation. During some of these halts, the cubs engaged in mock battles and chases with each other. Frequently, when the sow moved, the cubs lagged behind until suddenly, bursting into a "rocking" lope, they would rejoin her. My position was downwind from the bears and they seemed to have no idea they were under observation.

After about 10 minutes, the bears began to move out into the valley bottom in my direction. I retreated to the warden cabin (1/2 km distance), continued observation, and prepared to photograph the animals if the opportunity arose. The bears continued across the valley until they were opposite the cabin and across the river from me (approx. 100 m away). At this point, one cub in particular and then the sow, could apparently hear my camera shutter. Their uneasiness prompted them to move further up the valley along the river channel and begin crossing at a braided area further away. This brought them downwind to me and they obviously caught my scent, probably for the first time, as the cubs began standing erect and sniffing the air (approx. 400 m away). I whistled several times at different pitches and the sow halted and stood erect, sniffing the air for several seconds. As I repeated the whistles, she dropped to the ground and ran away into the forest with her cubs close behind. The time was 0940 on 17 June 1979.

At approximately 1600 that same day, a recent bear digging was noted along the

trail 2-1/2 km downriver from the earlier observations. *Hedysarum sulphurescens* plants had been dug out and the root eaten. The site was a rather open spruce-juniper-hairy wildrye forest and the condition of the plants and dryness of the soil suggested that the digging occurred early that morning and the previous night.

Upon returning to camp, a worker reported numerous bear diggings all across the slope behind and above the warden cabin, the same area I had sampled the previous day and saw no recent diggings.

At 2130 of the 17th, a wolverine was sighted in the river meadow. The animal was moving irregularly and continuously, apparently searching every inch of the area. The search covered a region near the point where the grizzlies were first sighted. At 2150 a cow elk ventured out onto the meadow watching the wolverine's activities. The elk didn't appear aggressive but rather extremely curious. Eventually she jumped a stream channel and came quite close to the wolverine. At 2200 the wolverine disappeared from sight and wasn't seen again. The cow elk walked over to a soil mineral lick and began eating soil.

On 18 June I obtained measurements of the bears' tracks, left in moist mud. The sow's track measured: Fp 4-1/2" across, 4-3/4" long (claw tips touched 3/4" beyond toe pad mark), Hp 4-1/2" across, 8" long. The cub tracks were: Fp 3-1/2" across, 3-3/4" long, Hp 3-1/2" across, 5-1/2" long. I also investigated the area in which the wolverine had been observed. While travelling along the far side of the meadow, sites where the bears had been noted to be feeding were checked. The area was mostly willow and dwarf birch shrubbery growing in mossy hummocks and occasionally a sedge or grassy area. *Hedysarum* occurred in the area and very little *Equisetum*. The only diggings observed were small clumps of willow which had been uprooted and some of their roots perhaps eaten.

Upon reaching the area where the wolverine had been observed, the remains of an elk calf were soon discovered. All edible portions had been completely consumed. Only portions of large bones, hooves and pieces of skin remained. The calf had apparently been killed the previous day as judged from the condition of the remains. Several large (3-4 m in diam.) areas of flattened vegetation surrounded the remains. Also observed in the area were several diggings which matched those along the meadow's edge. No tracks or other signs were detected.

CONCLUSIONS

From the facts available I reconstructed the following chain of events. On the morning of 16 June several elk cows with calves were observed on the meadows in the area of the lick. During that day the grizzlies moved across the mountain slope above and behind the warden cabin feeding on *Hedysarum* roots. That evening or early next morning they came down into the valley and crossed the river to the lick area. Here they located, killed and ate an elk calf. After feeding, they moved on up the valley along the far side from the cabin. At this point I sighted them and made the above observations. Later that same day a wolverine detected the kill and cleaned up anything that may have remained and continued to hunt for any overlooked remains. The elk cow, seeing movement on the meadow, moved out to investigate this animal as she was still searching for a lost calf.

Although the grizzlies weren't actually observed at the kill site there seems to be sufficient evidence to support the occurrence of the series of events as presented above.

I thank Geoff Holroyd, Canadian Wildlife Service, for his comments on an earlier draft of this note. These observations were made during the Banff-Jasper Ecological Wildlife Inventory conducted by the Canadian Wildlife Service for and funded by Parks Canada.

ANCIENT MURRELET IN CALGARY

by Allen N. Wiseley
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Alberta's second record of an Ancient Murrelet, *Synthliboramphus antiquus*, was reported from the Glenmore Reservoir in Calgary on October 17, 1982. Nick Godfrey made the unusual sighting in the presence of Vic Maltby and Rick Riddell, while the three were searching for two Red-throated Loons that had been seen on the reservoir during the previous day. The news of the vagrant bird spread quickly and brought several interested members of the local Calgary Field Naturalists' Society. They gathered near the reservoir's canoe club docks to identify it and get a first-hand view of a pelagic species seldom seen except from ocean-going boats. The bird seemed in good health, flying back and forth to other locations on the reservoir hundreds of metres away. It also dived for long periods of time, from 2 to more than 5 minutes, occasionally surfacing with a small fish in its bill. Its activity for the four days it was seen centered on the canoe club dock area and the channel across to Heritage Park. It was seen repeatedly until the evening of October 20.

The phenomenon of the Ancient Murrelet's occurrence inland is not unprecedented. Munyer (1965) and Verbeek (1966) have reviewed a historical series of reports from across North America and suggest that weather patterns are major factors in this phenomenon. They analyzed weather information for a week or more preceeding each of the sightings and found a recurrent pattern among them, keyed to (1) murrelet migration times (October-November; March); (2) low pressure centres over the Gulf of Alaska or the coastal areas; (3) strong westerly winds; and (4) storms, fog or other bad visi-

Ancient Murrelet, Glenmore Reservoir in Calgary

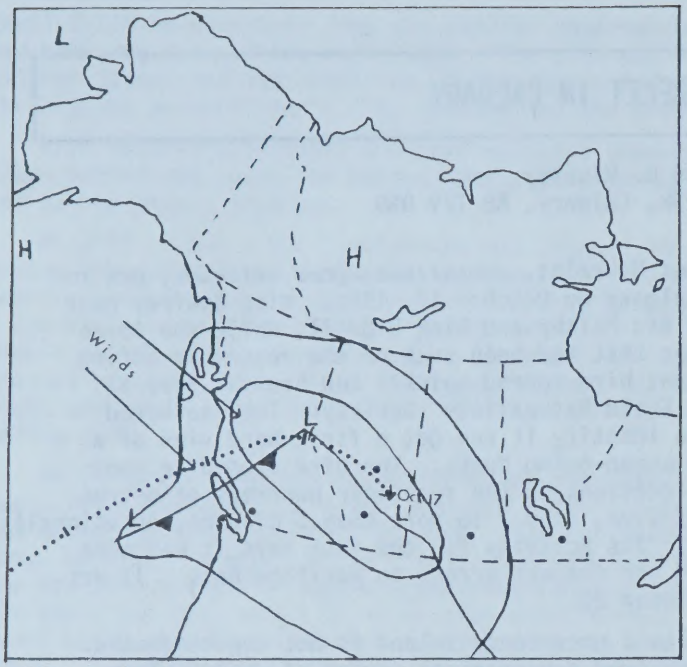

Figure 1. Low pressure area location on October 16 and resulting cold front moving across B.C. Dotted line indicates movement of the centre of the low pressure area in days prior to October 17.

bility conditions along the coast. The only previous discovery of the bird in Alberta, on October 25, 1975 (Weseloh and Weseloh, 1978) reportedly corresponded to a preliminary week of coastal snow storms and strong westerly winds in British Columbia. The bird was apparently emaciated and weak when found, making it difficult to estimate the time or place of arrival.

The Calgary bird was in good condition, suggested the possibility of a recent arrival. A review of weather patterns for the previous week showed that the only unusual surface disturbance for the week occurred from October 15 to 17 (see Figure 1). Further corroboration by N.E. Penny of the Pacific Region Atmospheric Environment Service indicated that the low pressure area that had developed over British Columbia and western Alberta on the 15th had produced a cold front moving southeastward and rapidly from coastal areas across B.C. and the southwestern edge of Alberta on the 16th. Similarly, surface winds along the coast during the week were westerly only on the 15th to the 17th, a result of the front, and likely would have been the agent that 'deflected' the direction of movement of this unlucky bird (per Munyer, 1965). Snow and rain accompanied the low and its cold front within Alberta and B.C. Apparently then, this record closely resembles a typical example of the pattern postulated by the previous authors.

LITERATURE CITED

Munyer, E.A. 1965. Inland wanderings of the Ancient Murrelet. Wilson Bull. 77:235-242.

Weseloh, D.V. and L.M. Weseloh. 1978. First record of the Ancient Murrelet for Alberta. Can. Field-Nat. 92(2): 200-201.

Verbeek, N.A.M. 1966. Wanderings of the Ancient Murrelet: some additional comments. Condor 68: 510-511.

ERRATUM

"The Great Blue Herons at Fish Creek Provincial Park: Monitoring Study 1982", by Joan Williams. Alta. Nat. 13(1): 1-4

- Paragraph 10 (p. 2), third sentence, "An average of 1.3 young/nest indicated a vigorous hatching success." *should read* "An average of 3.1 young/nest. . ."
- Paragraph 16 (p. 2), second sentence, "The present population of 80 birds. . . a reduction of 73% of the 1975 estimate." *should read* "a reduction to 73% of the 1975 estimate".

- My sincere apologies to the author. - Ed.

EXOTIC PETS IN ALBERTA: SOME CONCERNS AND SUGGESTIONS

by Dale A. Hampshire
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"We already have laws which prohibit the importation of exotic insects and diseases. Why do we bury our heads in the sane when we encounter vertebrate pests?" (Wagg, 1973)

INTRODUCTION: THE ALBERTA WILDLIFE ACT

In November 1983, the Alberta Legislature will meet to consider the newly rewritten Alberta Wildlife Act. The proposed revisions could include a redefinition of the Fish and Wildlife Division's position and responsibilities concerning the importing, selling and keeping of exotic animals. In the current act, all exotic animals, save a few listed in the appendix, are illegal in Alberta.

Initially, the appendix defined cows, horses, ground squirrels, etc. as non-wildlife. An addition to the appendix in 1979 included budgerigars, Guinea pigs, hamsters, gerbils and some other animals commonly found in pet shops. I conducted a survey of 25 of about 35 pet shops in Alberta and four pet sections of Department Stores in March 1983. This survey has shown that more than 93% of the species for sale, excluding fish, are apparently illegal in terms of the present Alberta Wildlife Act (fish were declared as non-wildlife, and therefore legal, in 1980). Some pet shop owners claim that they have permits to import these animals and licenses to sell them. However, (1) the permits issued by the Federal Government to import healthy, non-endangered species, and (2) the licenses issued locally to operate a pet shop, are not (3) the permits or licenses mentioned in the Wildlife Act and issued by the Lieutenant Governor in Council. These permits and licenses are generally given only to zoos, universities and game farms.

Why is it that the wildlife officers do not enforce this law? An article in the March 1980 issue of the Alberta Naturalist posed this question and called for immediate enforcement of this law. Wildlife officers respond to this by pointing out that a change is coming in the new Wildlife Act that would make most of these animals legal. In anticipation of this change, they claim (pers. comm.) that it would be unfair to enforce this law at the present time.

SOCIAL ISSUES

From time to time, we read in the newspapers about wildlife officers seizing a crocodile or an ocelot or some other exotic animal. Usually they are called in by police who are responding to a neighbour's complaint. Since the animal is usually illegal under the Wildlife Act, the wildlife people must seize it. Sometimes the animal, should it escape, would pose no real threat to human life or the natural environment. In this case, wildlife officers are put in an awkward position. They are responsible only for the protection of Alberta's natural environment. They do not feel they should become involved in social controversies concerning what non-harmful pets it is socially acceptable to keep. The new Wildlife Act, they hope, will divorce them entirely from these social issues. It is proposed that a new appendix be written listing those species that are environmentally undesirable. It would be illegal to transport these species, and to possess or sell them in Alberta. When seizing illegal species, the wildlife officers would explain that there was an environmental reason for the animal being seized. This new system would allow many Albertans who are currently breaking the law, most often unknowingly, to legally keep their pets. Also, municipalities may then be

be able to pass local by-laws restricting the keeping of species on the grounds that they are socially undesirable in that area. Of course, the immediate concerns are "What species should remain illegal and what would be the criteria for choosing these species?".

CURRENT IMPORT PROCEDURES

At the present time, in order to import an exotic animal into Alberta from a foreign country, four qualifications must be met. The animal must: (i) be accompanied by an exportation permit, indicating the good health of the animal, from the country of origin; (ii) be accompanied by a Canadian Import Permit; (iii) pass a veterinary inspection and satisfy any quarantine requirements; and (iv) be accompanied by a permit signed by the Lieutenant Governor in Council of Alberta, unless the animal is designated as non-wildlife in appendix one of the Wildlife Act. Due to the anticipated changes in the Wildlife Act, the last qualification is usually omitted.

The only criterion to be met in obtaining a Federal Import Permit is that the animal not be endangered as defined by the C.I.T.E.S. (Convention on International Trade in Endangered Species). Certain animals, such as turtles, which are known carriers of *Salmonella*, cannot be imported except under certain circumstances (e.g. for research) even though they may be free of disease. In some countries, Haiti for example, disease is so common that an export permit does not guarantee the animal is healthy. For this reason, nothing may be imported from those countries. In summary, if anyone wishes to import a healthy, non-endangered animal into Alberta, they are now being allowed to do so with very few exceptions.

SOME CONCERNS

Consider these facts:

(i) 98% of Hawaii's wildlife is made up of species introduced by accident or design by man (Long, 1981); (ii) The coypu or nutria *(Myocaster coypus)*, originally from Argentina, has escaped into the waterways of Great Britain and the southern United States. A prolific breeder, it now has the status of an agricultural pest and nuisance in both countries (Laycock, 1966). A similar disaster has recently been only narrowly averted in eastern Canada in the case of the raccoon dog *(Nyctereutes procyonoides)* which had been legally imported by a fur farmer (Taylor, 1981, 1983); (iii) The House Sparrow *(Passer domesticus)*, first introduced into America in 1850 to help control insects, has had an adverse impact on a number of native songbirds (MacCrimmon, 1977); (iv) "Over 100 diseases can be transmitted from animals to humans. These zoonoses are now rare in western countries but some, due to the rise in the pet population, are on the increase." (The Diagram Group). The Center for Disease Control in Atlanta, Georgia, records cases of psittacosis (parrot disease) in humans every year in the United States; (v) Nearly 900 species of animals are today in serious danger of extinction; and (vi) It is estimated that between 30,000 and 40,000 people (excluding Chinese and Russians) die from snakebite each year.

Two of the greatest concerns in regard to importing animals are (1) the protection of endangered species and (2) the danger of disease introduction, either to humans or animals. Canada is an active member of C.I.T.E.S. and the restrictions on trade in endangered species are strictly enforced. The Canadian Wildlife Service publishes up-to-date appendices of C.I.T.E.S. which are then enforced by customs officers. In regards to the health risk, Canada Agriculture is very well-informed as to disease outbreaks in foreign countries and maintains tight inspection procedures to eliminate disease carriers. It has two research stations where research is done on animal diseases, their symptoms and dangers. One of these, the Animal Disease Research Institute, is at Lethbridge, Alberta. The results of their experiments have resulted in many of the regulations applied to imported animals. Endangered species restrictions and imported

animal health regulations need not, therefore, be a concern of the Alberta Fish and Wildlife Division.

The effects of introduced species on natural environments have been well documented by several authors (Elton, 1958; Laycock, 1966; MacCrimmon, 1977; and Long, 1981). Some of the species listed in the appendix to the Wildlife Act, and therefore legal in Alberta, have bad reputations in some countries of the world. Some examples include: (1) European carp were introduced in 1877 to North America and now fill the rivers and lakes of Ontario, and have displaced many of that province's gamefish. Goldfish, which are closely related to carp, are common in pet shops. In southern Ontario, they have been released into lakes and have also established populations there. Japanese carp were sold in 17% of the pet shops I surveyed. These carp are closely related to European carp. Can Japanese carp or even goldfish survive in Alberta's lakes and rivers? If so, it will not be long before they are introduced, when someone lets them go "back to nature" once they grow too large for his aquarium. (2) The Monk Parakeet *(Myiopsitta monachus)* is a major cereal crop pest in its native South America. Crop losses are estimated at 2-15% annually. Shooting, poisoning, netting, the burning of nesting grounds and other extreme methods have not been effective in stopping the crop destruction. The Monk Parakeet has established breeding populations, as a result of pet escapes, all along the east coast of the United States and in California. This parakeet is a threat to agricultural crops (Wagg, 1973; David, 1974) but it is legal to sell it in Alberta. (3) Similarly, lovebirds (*Agapornis* sp.) have the status of agricultural pests in Africa. Lovebirds are common in Alberta pet shops, are always sold in pairs, and many species breed here in captivity. (4) The budgerigar *(Nelopsittacus undulatus)* has established breeding populations from Florida to New England in the U.S. Budgies were found in every pet shop surveyed in Alberta. (5) Two types of finches are legal in Alberta. The society finch *(Lonchura striata)* was found in 45% of the pet shops surveyed. This finch is a popular pet and is bred in captivity all over the world. The zebra finch *(Poephila guttata)*, while native to northern Australia, has been known to survive British winters. Although it is legal to keep only these two finches in Alberta, 33 other species are sold in pet shops here. Although not found in this survey of Alberta pet shops, bullfinches *(Pyrrhula pyrrhula)* are responsible for enormous damage to Britain's orchards (Wright and Summers, 1960; Newton, 1964, 1968). One wonders whether one of the thirty-five species of finches in our pet shops could establish a breeding population in western Canada and what impact they would have. Quite a number of these species have been introduced successfully into other countries. These include the pekin robin, grenadier weaver, spice finch, Java sparrow, orange-cheeked waxbill, European goldfinch, silverbilled finch, strawberry finch and bronze-winged mannikin. Most of these finches, particularly the African finches, are serious orchard or grain pests in their native range. One type, the red-billed weaver or black-faced dioch *(Quelea quelea)* is such a destructive pest in Africa (Ward, 1964) that flamethrowers have been used to try to control their populations. "Quelea is now known to affect adversely the economies of between twenty and twenty-five nations by its attacks on cereal crops - millet, guinea-corn, wheat and rice" (Crook and Ward, 1968). (6) The collared turtledove *(Streptopelia decaocto)* has established itself in Europe, Britain, Northern China, Korea, Japan, the U.S. and New Zealand. It is given a nuisance rating around orchards and granaries. The hill mynah *(Gracula religiosa)* has established itself in Hawaii and Florida as a result of pet escapes. The bird's cousin, the crested mynah *(Acridotheres tristis)* is successfully established near Vancouver. (7) Many other types of birds found in Alberta pet shops have established themselves in foreign countries. The list of potential problem species goes on, but I feel it is necessary to describe only one more, the rose-ringed parakeet *(Psittacula Krameri)*, a native of India and Central Africa. This bird is successfully established in Britain, most of Asia, Hong Kong, California, Florida and Long Island. They are orchard and cereal crop pests and destroy much more than they eat. In their native India, they are responsible for the wasting of 20% of the maize crop and 30% of the fruit crop. This species was found in

2 pet shops in Alberta. (8) The Mongolian gerbil *(Meriones unguiculatus)*, found in 23 Alberta pet shops, is viewed by the State of California as a potential agricultural pest and is banned. A friend of mine was recently travelling to California with his son and his pet gerbil. The border control officer explained that gerbils were not allowed, and offered his hammer to solve the problem! California is only one of the states in the U.S. that is very concerned about what animal life comes in.

Since most of the species described above are from much milder climates than Alberta, it could be argued that none of these have a chance of surviving our winter. It was assumed that the European starling (*Sturnus vulgaris*) could not survive our Canadian winter. Taverner (1920) said: "In Canada, we have congratulated ourselves that our climate would prevent the intrusion of the starling into our country. . . but it now looks as if our complacency is to be rudely shattered." We all can judge to what extent the European starling has intruded into our country. I am not suggesting that all, or even any, of the species currently found in Alberta pet shops could establish themselves as well as the starling. But I am protesting the fact that any healthy, non-endangered species can be imported into Alberta before any prediction of its environmental impact, should it escape, has been made.

There is one final issue: poisonous animals. Poisonous fish, amphibians, snakes, lizards and insects can be very dangerous to inexperienced owners, or unsuspecting bystanders. Occasionally, also, large pet mammals, such as ocelots, attack or mail their owners. The health risks involved in keeping dangerous pets require that there be quite detailed regulations regarding these species.

CONCLUSION

As a result of the examples discussed above, I submit that the following criteria should be used to decide the status, allowed or disallowed, of any animal which is proposed for importation:

i) no endangered species should be imported;
ii) no species should be imported unless it is inspected and disease-free;
iii) no species considered to be dangerous to man should be imported or kept except by those who are qualified keepers; and
iv) no species should be imported unless a detailed assessment of its environmental impact, should it escape, is done by a qualified biologist. The results of the assessment must show that it is not a pest or nuisance in any other country (a 'bad record'), and that its environmental impact on native Canadian animals would probably be insignificant.

Ecologists have known for many years that natural ecosystems can be very delicately balanced. Even a slight disturbance can destabilize the entire system. Alberta possesses many diverse natural areas and is therefore vulnerable in this way. It is the responsibility of the Fish and Wildlife Division to protect our wildlife. It is, therefore, very important that the new Alberta Wildlife Act should address the issue of exotic animals in Alberta. Their impact on our natural, as well as human, environment, must be fully understood.

APPENDICES

LIST OF ANIMAL SPECIES FOUND IN 29 ALBERTA PET SALES OUTLETS, MARCH 1983

Notes: (1) A total of 29 shops were visited (25 pet shops, 4 Department Stores). The number of shops in which each species was found is stated in the left-hand column. (2) In the shops, I recorded the birds' common names from the labels (or by enquiry). In those cases where the name provided by the shop was not a recognized vernacular name, the probable correct identification is used instead in the list and the pet shop

name is given in brackets. In most such cases I was able to match the pet shop name with an alternative English name, in Forshaw (1973) in the case of parrots and Restall (1975) in the case of finches. (3) The list of fishes is short because (i) most freshwater fish are not taken from the wild but captive-bred; and (ii) tropical marine fishes, which are taken from the wild, could not survive in Alberta, and none that I saw were on the C.I.T.E.S. appendices 1 or 2. Some were, however, very poisonous species.

APPENDIX I. AVES

4 Button Quail, *Turnix* sp., range, Africa and South Asia

4 Domestic Chicken, *Gallus gallus*

5 Diamond Dove, *Geopelia cuneata*, Australia

7 Collared Turtledove *Streptopelia decaocta*, India and West Africa. (Established in Europe, Britain, Scandinavia, Northern China, Korea, Japan, U.S.A., and New Zealand; British orchard pest)

1 Australian Crested Dove *Ocyphaps lophotes*, Australia

4 White Dove

2 Blue-fronted Amazon *Amazona aestiva*, Central and Southeastern South America (common), crop pest

2 White-fronted Amazon *Amazona albifrons*, Central America (common), grain pest

1 Orange-winged Amazon *Amazona amazonica*, northern South America (abundant), crop pest

10 Red-lored Amazone (Yellow-cheeked Amazon, Red-headed Amazon) *Amazona autumnalis*, Central America (common)

1 Mealy Amazon *Amazona farinosa*, central and northern South America (uncommon)

1 Blue-headed Amazon *Amazona farinosa guatemalea*, Central America (uncommon)

2 Lilac-crowned Amazon *Amazona finschi*, western Mexico, fruit and crop pest

6 Yellow-crowned Amazon (Double-yellow Amazon) *Amazona ochrocephala*, Central America and northern South America (common), corn pest in South America, escapees established in California, Texas, individuals have survived at least one winter in New York

1 Green-cheeked Amazon *Amazona viridigenalis*, northeastern Mexico (common), corn pest

1 Maroon-bellied Amazon

4 Blue-crowned Conure *Aratinga acuticaudata*, central South America (uncommon)

2 Gold-capped Conure (Gold-headed Conure) *Aratinga aurea*, Brazil (common)

1 Orange-fronted Conure (Half-moon Conure) *Aratinga canicularis*, western Central America (abundant)

1 Red-fronted Conure *Aratinga frontalis*, western South America (abundant)

2 White-eyed Conure *Aratinga leucophthalmus*, central eastern South America (common)

2 Red-masked Conure (Cherry-headed Conure) *Aratinga erythrogenys*, western and central South America (common), restricted range

1 Mitred Conure *Aratinga mitrata*, western South America (common). Conures cost between $100 and $200 each, locally.

1 Brown-throated Conure *Aratinga perttnax*, Central America and northern South America (common)

11 Dusky-headed Conure *Aratinga weddellii*, western South America (common)

2 Patagonian Conure *Cyanoliseus patagonus*, Chile and Argentina (rare)

3 Nanday Conure *Nandayus nenday*, south-central South America (common)

2 Green-cheeked Conure *Pyrrhura molinae*, central South America (abundant)

1 Grey-cheeked Conure

2 Umbrella Cockatoo *Cacatua alba*,

4 Goffin Cockatoo *Cacatua goffini*, Tanimbar Islands. Small range, local price $800

4 Salmon-crested Cockatoo (Moluccan Cockatoo) *Cacatua moluccensis*, Moluccan Islands (common), pest

2 Galah Cockatoo *Eclophus roseicapillus*, Australia (abundant)

1 Little Corella Cockatoo (Bare-eyed Cockatoo) *Cacatua sanguinea*, Australia (abundant), grain pest

8 Sulphur-crested Cockatoo *Cacatua sulphurea*, southeast Asian Islands (common, declining), also called Triton Cockatoo

3 Citron-crested Cockatoo *Cacatua sulphurea citronocristata*, Samba Islands

1 Blue Lovebird, legal in Alberta, lovebirds are sold locally, cost $70

2 Masked Lovebird *Agapornis personata*, eastern Africa. Pest in Africa, legal in Alberta, rarely sold singly

12 Peach-faced Lovebird *Agapornis roseicollis*, southwestern Africa (common). Pest in Africa, legal in Alberta

29 Budgerigar (Budgie) *Melopsittacus undulatus*, Australia (common). Popular pet, wild breeding populations in US, legal in Alberta

24 Cockatiel *Nymphicus hollandicus*, Australia (common)

9 Blue and Yellow Macaw *Ara ararauna*, northern and central South America (common, declining)

2 Yellow-collared Macaw *Ara auricollis*, central South America (common)

1 Green-winged Macaw *Ara chloroptera*, northern South America (common)

4 Scarlet Macaw *Ara macao*, central and northern South America (uncommon), C.I.T.E.S. Appendix 3

3 Military Macaw *Ara militaris*, Mexico to Bolivia (common)

3 Red-shouldered Macaw (Noble Macaw) *Ara nobilis*, eastern and northern South America (abundant)

1 Chestnut-fronted Macaw *Ara severa*, northern South America (common)

1 Red-fronted Macaw *Ara rubrogenys*, Bolivia (restricted range)

1 Hyacinth Macaw *Anodorhynchus hyacinthinus*, interior of Brazil (common)

1 Dwarf Macaw

3 Orange-chinned Parakeet (Tovi Parakeet, Bee Bee Parakeet) *Brotogerys jugularis*, southwestern Central America (abundant), orchard pest

2 Canary-winged Parakeet *Brotogeris versicolurus*, eastern South America (common), escaped and established in Florida and up the coast to New York, known carrier of Newcastle disease

2 Red Lory *Eos bornea*, Indonesia (common)

1 Monk Parakeet (Quaker Parrot) *Myiopsitta monachus*, southeast South America (abundant), major cereal pest in South America, escapees established population on east coast of U.S., which is on the rise, legal in Alberta

1 Bourkes Parrot *Neophema bourkii*, south-central Australia (common)

1 Blue-headed Parrot *Pionus menstruus*, northern South America (uncommon)

1 White-capped Parrot *Pionus senilis*, eastern Central America (common), pest

1 Eastern Rosella (Rosella Parrot) *Platycercus eximius*, southeastern Australia (abundant), orchard pest

8 Princess Parrot (Princess of Wales) *Polytelis alexandrae*, central and western Australia (rare), C.I.T.E.S., appendix 2

2 Meyer's Parrot (Brown Parrot) *Poicephalus meyeri*, central East Africa (common)

4 Senegal Parrot *Poicephalus senegalus*, central Africa (abundant)

2 Red-rumped Parrot *Psephotus haematonotus*, southeastern Australia (common), orchard pest

1 Mulga Parrot *Psephotus varius*, central and southern Australia (common)

4 Mustached Parakeet *Psittacula alexandri fasciata*, southeast Asia (common), rice crop pest

7 Grey Parrot (African Grey) *Psittacus erithacus*, central Africa (common)

2 Rose-ringed Parakeet (Indian Ringnecked Parakeet) *Psittacula krameri*, India and central Africa (common). Orchard and grain pest in India and Africa, escapees established in England, Hong Kong, Florida, California and on Long Island, N.Y.

2 Barabas Parrot

2 Grass Parakeet

1 Mealy Parakeet

2 Toco Toucan *Ramphastos toco*, South America (difficult to keep, sensitive to bad weather)

8 Hill Mynah *Gracula religiosa*, India and southeast Asia. Established in Florida and Hawaii from pet escapees

7 Cutthroat Finch *Amadina fasciata*, Senegal across to the Sudan

1 European Goldfinch *Carduelis carduelis*, Europe and western Asia, established in New Zealand, Australia, Argentina, Bermuda, Long Island colony in U.S. was extirminated

1 Gouldian Finch *Chloebia gouldiae*, northern Australia

4 Gold-breasted Bunting *Emberiza flaviventris*, south Africa

2 Orange Weaver *Euplectes orix franciscana*, Senegal to the Sudan, agricultural pest

1 Red Bishop (Grenadier Weaver) *Euplectes orix orix*, south Africa, agricultural pest in Africa, established in Australia and Hawaii

1 Lavender Finch *Lagnostica caerulescens*, western Africa

4 Red-billed Leiothrix (Pekin Robin, Pekin Nightingale) *Leiothix lutea*, southeast Asia, established in Hong Kong and Hawaii, known carrier of bird malaria in Japan

2 Fernando Po Mannikin *Lonchura bicolor*, west Africa

1 Bronze-winged Mannikin *Lonchura cucullata*, Africa, established in Puerto Rico

3 Silverbill Finch *Lonchura malabarica*, India and central Africa, established in Hawaii and Puerto Rico

1 White-headed Munia (Nun Finch) *Lonchura maja*, Malaysia to New Guinea

1 Scaly-breasted Munia (Spice Finch) *Lonchura punctulata*, southeast Asia, grain crop pest in Asia, established populations in Hawaii and Australia

13 Society Finch *Lonchura striata*, legal in Alberta

1 Mannikin Finch *Lonchura sp.*, India to Malaysia

1 Green Twinspot Finch *Mandingoa nitidula*, Mozambique

1 Cardinal Finch *Paroaria sp.* Africa

1 Gold Sparrow *Passer luteus*, Africa

1 Bengalle *Ploceus bengalensis*, northern India

3 Masked Weaver *Ploceus intermedius*, east and south Africa, agricultural pest

16 Zebra Finch *Poephila guttata*, northern Australia, will survival British winter, legal in Alberta

3 Star Finch *Poephila ruficauda*, Australia

2 Aurora Finch *Pytilia phoenicoptera*, western Africa

2 Red-billed Weaver (Black-faced Dioch) *Quelea quelea*, Africa (abundant), extremely destructive crop pest in Africa, flamethrowers used in attempts to eradicate

1 Yellow-rumped Seedeater (Black-throated Finch) *Serinus atrogularis*, Africa

24 Canary *Serinus canarius*, Canary Islands and Madiera, legal in Alberta

2 Scaly Finch *Sporopipes sp.*, south Africa

3 Paradise Whydah *Steganura paradisea*, Africa

7 Cordon Bleu *Uraeginthus bengalus*, central Africa

6 Red-eared Finch *Zonaeginthus oculatus*, Australia, C.I.T.E.S. Appendix 3

7 Red Avadavat (Strawberry Finch) *Amandava amandava*, India and southeast Asia, established in Phillipines, Hawaii and Japan

1 Black-cheeked Waxbill *Estrilda erythronotos*, southern and eastern Africa

4 Orange-cheeked Waxbill *Estrilda melpoda*, central and western Africa, escaped and established in Japan, Hawaii, Puerto Rico and southern California

1 Orange-breasted Waxbill *Estrilda subflava*, south Africa

1 Laughing Thrush *Macroura indica*

3 Java Sparrow *Padda oryzivora*, Java, Bali and Sumatra, escaped and established in Hawaii, Japan, Pennsylvania, Florida and Connecticut in the U.S.

1 Song Sparrow *Zonotrichia leucophrys*, North America

APPENDIX II. PISCES.

2 Freshwater Stingray *Paratrygon sp.*, northern and central South America

27 Goldfish *Carassius auratus*, China (common), released pets have established populations in some southern Ontario lakes, will breed with wild carp

5 Koi (Japanese Carp) *Cyprinus carpio*, China (common), closely related to the European Carp which, when released in southern Ontario became a major aquatic pest

APPENDIX III. AMPHIBIA.

1 Poison Arrow Frog *Dendrobatidae sp.*, South America
1 Green Tree Frog
5 African Aquatic Frog *Zenopus laevis*, Africa
4 Eastern-spotted Newt *Desmognathus fuscus fuscus*, eastern U.S.A.
2 Fire Newt (California Newt) *Taricha torosa*, California
11 Red-bellied Newt (Japanese Newt)
3 Mudpuppy, *Necturus maculosus*, eastern North America

APPENDIX IV. REPTILIA

1 Takay Gecko *Gekko gecko*, Bengal, southern China and Indonesia (common)
1 Banded Gecko *Coelonyx variegatus*, California and southern Texas
1 Flying Gecko *Ptychozoon homalcephalum*
1 Fat-tailed Gecko
1 House Gecko
2 Golden Skink
1 Long-tailed Skink
1 Pigmy Skink
1 Brown Swift
3 American Chameleon *Anolis carolinensis*, southern U.S.A.
1 Chalote *Calotes sp.*, India and Malaya (common)
2 Spiny Lizard *Moloch horridus*, Australia
1 Horned Lizard *Phrynosoma coronatum*, Mexico and southern U.S.A.
1 Iguana *Iguana iguana*, South America
1 Green Lacerta *Lacerta viridis*, Europe, Asia and Africa (common)
1 Mangrove Snake *Boiga dendrophila*, Southeast Asia
1 Black Racer *Constrictor constrictor foxi*, North America
1 Reticulated Python *Python reticulatus*, Indo-Malaya
4 Burmese Python
1 Blood Python
2 Garter Snake *Thamnophis sirtalis sirtalis*, North America (common)
3 Haitian Tree Boa (may be a misnomer, for health reasons no animal is legally imported from Haiti)
1 Texas Indigo Snake
1 Yellow Rat Snake
1 Black Rat Snake
1 Green Rat Snake

APPENDIX V. MAMMALIA.

1 Spiny Mice *Perognathus spinatus*

8 Mice *Mus musculus*, legal in Alberta, fancy mice first bred in Japan although mice have lived with man for thousands of years

19 Hamster *Mesocricetus auratus*, Middle East (uncommon)

23 Mongolian Gerbil (Common Gerbil) *Meriones unguiculatus*, eastern Asia and Mongolia, legal in Alberta, banned in some American states, crop pest risk

17 Guinea Pig (Cavy) *Cavia porcellus*, Peru (uncommon), legal in Alberta

14 Domestic Rabbit

1 Chinchilla *Chinchilla laniger*, South America (rare), bred in captivity extensively by fur farmers, rare as pet, listed on C.I.T.E.S. Appendix I

1 Marmoset Monkey *Callithrix jacchus*, Amazon

APPENDIX VI. CRUSTACEA.

8 Crayfish *Astacus fluviatilis*, eastern North America (common), comes to Alberta by mistake with shipments of goldfish, prefers coldwater habitat

4 Ghost Shrimp (Blue Lobster) *Lysmata seticaudata*, Mediterranean

4 Fiddler Crab *Uca uca*, Tropical Indo-pacific Coasts (common)

8 Tree Crab, easty-to-keep, popular pet

3 Devil Crab

APPENDIX VII. ARACHNIDA.

8 Red-legged Tarantula *Brachyrelma smithi colima*, Mexico

1 Haitian Tarantula

3 Palamino Tarantula

1 Pink-toed Tarantula

BIBLIOGRAPHY

Center for Disease Control. 1979. Psittacosis Surveillance, annual summary 1978. Atlanta, Ga.

Crook, J.H. and Ward, P. 1968. The Quelea problem in Africa. pp. 211-229 in Murton, R.K. and Wright, E.N. (Eds.). The Problems of Birds as Pests. London: Institute of Biology and Academic Press (Symposia of the Institute of Biology No. 17)

Davis, L.R. 1974. The Monk Parakeet: a potential threat to agriculture. Proc. 6th Vert. Pest Control Conf., Anaheim, Calif.: 253-256.

Elton, C.S. 1958. The Ecology of Invasions by Animals and Plants. Methuen, London. 181 pp.

Forshaw, J.M. 1973. Parrots of the world. Doubleday and Co. Inc., New York. 583 pp.

Kibbe, D.P. and Cutright, N.J. 1973. The Monk Parakeet in New York. Proc. 6th Bird Control Seminar, pp. 74-78, Bowling Green State Univ.

Laycock, George. 1966. The Alien Animals. Natural Hist. Press, New York. 240 pp.

Long, J.L. 1981. Introduced birds of the world. David and Charles, London. 528 pp.

MacCrimmon, H.R. 1977. Animals, man and change. McClelland and Stewart, Toronto. 160 pp.

Newton, I. 1964. Bud-eating by bullfinches in relation to the natural food supply. J. Applied Ecol. 1: 265-279.

Newton, I. 1968. Bullfinches and fruit buds. pp. 199-209 in Murton, R.K. and E.N. Wright (Eds.), The Problems of Birds as Pests. London: Inst. of Biol. and Academic Press (Symposia of the Inst. of Biol. No. 17)

Restall, R.L. 1975. Finches and other seed-eating birds. Faber and Faber, Britain.

Taylor, R. 1981. Raccoon dogs and the OFNC. Trail and Landscape 15(1): 4-6. (Ottawa Field Naturalists Club)

The Diagram Group. Pets, every owner's encyclopedia. Paddington Press, New York. 431 pp.
Wagg, C.A. 1973. The Monk Parakeet and New Jersey agriculture. Proc. 6th Bird Control Sem., pp. 82-84, Bowling Green, State Univ.
Ward, P. 1964. The war against the Quelea bird. New Scientist 22: 736-738.
Wright, E.N. and D.D.B. Summers. 1960. The biology and economic importance of the bullfinch. Annals of Applied Biol. 48: 415-418.

THE FAMILIES OF SPIDERS IN ALBERTA AND CANADA

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There are 27 families of spiders that are native (= precinctive) to Canada, and at least four that are regularly introduced, giving a total of 31 families of spiders found in Canada. The introduced families are Sparassidae (giant crab spiders), Selenopidae (flat-bodied spiders), Loxoscelidae (which includes the deadly violin spider, or brown recluse), and Theraphosidae (common in pet shops to be sold as pets, such as the Mexican Red Leg *Eurypelma smithi* (F. Pickard-Cambridge)). All 31 families will be included in the following key.

Several of the families (not including the exotic imports) are recorded here for the first time in Canada. All new records are from specimens in my own collection.

There are at least two main ways to prepare lists of families of animals - in a strict alphabetical listing so that anyone can easily find the name of a particular family, or a phylogenetic listing, which indicates a possible classification of the families from the most primitive to the most advanced. Both listing systems are presented here:

ALPHABETICAL LIST

Agelenidae	- funnel web spiders
Antrodiaetidae	- folding-door trap-door tarantulas
Amaurobiidae	- dark-loving spiders
Anyphaenidae	
Araneidae	- orb weaving spiders
Atypidae	- purse web tarantulas
Clubionidae	- pale two-clawed hunting spiders
Dictynidae	- mesh weaving spiders
Erigonidae	- dwarf spiders
Gnaphosidae	- dark two-clawed spiders
Hahniidae	
Linyphiidae	- line weaving spiders
Loxoscelidae	

Lycosidae	- wolf spiders
Mimitidae	- pirate spiders
Oonopidae	
Oxyopidae	- lynx spiders
Philodromidae	- dry heat-loving spiders
Pholcidae	- daddy long-legs spiders (basement spiders)
Pisauridae	- nursery web spiders
Salticidae	- jumping spiders
Scytodidae	- glue-spitting spiders
Selenopidae	- flat-bodied spiders
Sparassidae	- giant crab spiders
Tetragnathidae	- grass spiders
Telemidae	- lungless spiders
Theraphosidae	- tarantulas (the usual large, hairy tarantulas)
Theridiidae	- comb-footed spiders
Theridiosomatidae	- ray spiders
Thomisidae	- crab spiders
Uloboridae	- geometric orb web spiders

Note that not all spider families have common names. When an animal group is known by the general public, or has some significance to it, it usually is given a common name. Many spider and insect families have never been seen by the public.

PHYLOGENETIC LIST OF SPIDERS FOUND IN CANADA

There is considerable argument and discussion about phylogeny within the spiders. The following is adapted from Kaston (1978) and Lehtinen (1967) and is the conservative, almost classical, view.

Order Araneida (Araneae of some authors)
- Suborder Orthognatha
  - Infraorder Liphistomorpha (Atypical tarantulas)
    - Family Antrodiaetidae
    - Atypidae
  - Infraorder Theraphosomorpha (typical tarantulas)
    - Family Theraphosidae
- Suborder Araneomorpha
  - Infraorder Neocribellatae
    - Family Uloboridae
    - Dictynidae
    - Amaurobiidae
  - Infraorder Ecribellatae (snare or web-building spiders)
    - Family Scytodidae
    - Loxoscelidae
    - Oonopidae
    - Telemidae
    - Pholcidae
    - Theridiidae

Linyphiidae
Erigonidae
Theridiosomatidae
Araneidae
Tetragnathidae
Agelenidae
Hahniidae
Three-clawed Hunting Spiders
Mimetidae
Pisauridae
Lycosidae
Oxyopidae
Two-clawed hunting spiders
Gnaphosidae
Clubionidae
Anyphaenidae
Sparassidae
Selenopidae
Thomisidae
Philodromidae
Salticidae

All spiders produce silk for one or more uses: to wrap around eggs to make the egg sac; to line a tunnel or retreat that serves as "home"; to build a snare or web to catch prey; to wrap prey; to serve as a drag line. The drag line is the silk a spider produces and emits everywhere it goes. Drag lines serve several purposes, among them being for ballooning or dispersing through the air, retracing their wanderings, and as a life line in the event the spider falls as it walks along.

A stereo microscope with at least 25 to 30 diameters magnification will be necessary to see many of the features on spiders that are used in the key. In addition, there are a number of books available for general reading on spiders, but the main ones are Kaston (1978, 1981), Levi et al (1968), Gertsch (1949), and Comstock (1948). Patent (1982) has also written a short, well-illustrated book that will be of use to both teachers and students.

If anyone would like confirmation of identification of any spiders, please do not hesitate to contact the author.

KEY TO THE FAMILIES OF SPIDERS KNOWN TO OCCUR IN CANADA*

1A Chelicerae paraxial, that is, projecting forward, so that the fangs move in a direction more or less parallel with the body length of the spider; 2 pairs of book lungs (figure 5). . . . . .Suborder Orthognatha. 2

1B Chelicerae diaxial, that is, projecting downward, so that the fangs move in a direction more or less transversely to the body length (figure 6); usually with 1 pair of book lungs, and a pair of tracheal spiracle openings (appearing as one slit) located between the epigastric furrow and the spinnerets. . . . . Suborder Araneomorpha. 4

2A Abdomen without tergites or sclerotized areas on dorsal side (fig. 1); anal tubercle immediately behind spinnerets; cheliceral fang furrow distinct. . . . . THERAPHOSIDAE

2B Abdomen with one to three sclerotized areas (tergites) on dorsal side (fig. 7); anal tubercle separated from spinnerets by a considerable distance; cheliceral fang furrow indistinct. 3

3A Endites strongly developed (fig. 5); labium fused to sternum; 8 sigilla plainly visible on sternum (fig. 5). . . . . ATYPIDAE

3B Endites weakly developed; labium distinct from sternum (fig. 6); sigilla small or indistinct; chelicearae with rastellum (fig. 7). . . ANTRODIAETIDAE

4A With a cribellum in front of spinnerets (fig. 8), and a calamistrum on Metatarsus IV (fig. 9). 5

4B Lacking a cribellum and calamistrum. 7

5A Tarsi with a dorsal row of trichobothria increasing in length distally (fig. 10); 8 eyes, all light in colour . . . . . AMAUROBIIDAE

5B Tarsi lacking trichobothria, or with at most one; 8 eyes, all dark, or at least two dark in colour, or only 6 eyes 6

6A 8 eyes, all dark; eye rows recurved . . . . . ULOBORIDAE

6B 6 or 8 eyes; if 8 eyes, anterior median eyes dark; if 6 eyes, pearly white, then anterior median eyes lacking . . . . . .DICTYNIDAE

7A Book lungs lacking; in Canada, known only from south central British Columbia; spiders small, less than 2 mm total length, 6 eyes in 3 groups of 2 . . . . . TELEMIDAE

7B Book lungs present (fig. 6). 8

8A Tibia and metatarsus I and II with a prolateral row of long spines (fig. 12); in between each long spine is a row of shorter spines, curved at tips, increasing in length distally. . . . . MIMETIDAE

8B Tibia and metatarsus I and II lacking spines, or spine arrangement not as in 8A. 9

9A Chelicerae fused at base, and each provided distally with a lamella drawn out to a tooth which touches the tip of the fang (fig. 13). 10

9B Chelicerae not fused at base, may or may not have a lamella. 12

10A Tarsi long and flexible, with many pseudosegments; spiracle lacking; labium wider than long . . . . . PHOLCIDAE

10B Tarsi normal, lacking pseudosegments; spiracles present, at least 1/6 distance between spinnerets and epigastric furrow. 11

11A Thoracic furrow conspicuous and longitudinal (fig. 1); tarsi with 2 claws; sternum pointed behind; spiracles about 1/6 distance from spinnerets to epigastric furrow . . . . . LOXOSCELIDAE

11B Thoracic furrow inconspicuous; tarsi with 3 claws; sternum not pointed behind; spiracles about 1/4 distance from spinnerets to epigastric furrow (fig. 14). . . . . SCYTODIDAE

12A With 6 eyes, anterior median eyes larger than lateral eyes (fig. 15) . . . . . OONOPIDAE

12B With 8 eyes. 13

13A With 6 eyes in front row when viewed from the front of the spider (fig. 16) . . . . . SELENOPIDAE

13B With 2 or 4 eyes in front row 14

14A Tarsi with 2 claws, with or without claw tufts (if claw tufts present, then only two claws present) (fig. 18). 15

14B Tarsi with 3 claws (2 larger, lateral ones, and a smaller median one); tarsi lacking claw tufts (fig. 17). 21

15A From above, eyes apparently in 3 rows (fig. 19). . . . . SALTICIDAE

15B Eyes apparently in 2 rows (fig. 1). 16

16A Tracheal spiracles 1/3 to 2/3 distance (figs. 20, 21) between spinnerets and epigastric furrow. . . . . ANYPHAENIDAE

16B Tracheal spiracles in usual place, just in front of spinnerets (fig. 2). . . . 17

17A Legs I and II laterigrade, that is turned so that the morphologically dorsal surface is posterior, giving legs a position similar to that of a crab. 18

17B All legs in normal position (usual prograde type of leg). 20

18A Back margin (retromargin) of cheliceral fang furrow with teeth; distal end of metatarsus with a soft, 3-lobed membrane allowing hyper-extension of tarsus (tarsus can bend backwards) . . . . . SPARASSIDAE

18B Retromargin of cheliceral fang furrow smooth, the promargin with at most one or two teeth; distal end of metatarsus sclerotized so that leg can extend only to being straight. 19

19A Colulus present at base of anterior spinnerets (fig. 23); hair on body simple and erect; Legs I and II much longer and thicker than Legs III and IV. Promargin of cheliceral fang furrow lacking teeth . . . . . THOMISIDAE

19B Colulus absent; hair on body feathery or scaly, and prone; all legs about the same length, or only leg II much longer; promargin or cheliceral fang furrow with 1 or 2 teeth . . . . . PHILODROMIDAE

20A Anterior spinnerets conical (fig. 23), bases contiguous or nearly so, and not more heavily sclerotized than posterior spinnerets; eyes homogeneous (few, rare exceptions); endites lacking any sort of transverse or oblique depression . . . . . CLUBIONIDAE

20B Anterior spinnerets cylindrical, longer and more heavily sclerotized than posterior spinnerets; anterior spinnerets separated at base by about the diameter of one apart; eyes distinctly heterogeneous; endites with an oblique depression. . . . . GNAPHOSIDAE

21A The 6 spinnerets in a more or less transverse row; tracheal spiracles at least 1/3 distance from spinnerets to epigastric furrow (fig. 24). . HAHNIIDAE

21B Spinnerets not in a line; tracheal spiracles just in front of spinnerets. 22

22A From front, eye group hexagonal (fig. 25); clypeus high (about 3 or 4 diameters of lowest eyes); abdomen pointed posteriorally, and legs with prominent spines . . . . . OXYOPIDAE

22B Eye group not formed as a hexagon, and clypeus much lower. 23

23A Tarsus IV with 6 to 10 serrated bristles on ventral side (fig. 26); spiders hang upside down in an irregular mesh web. . . . . THERIDIIDAE

23B Tarsus IV lacking comb. 24

24A Tarsi with trichobothria (fig. 10); labium (lip) not rebordered 25

24B Tarsi lacking trichobothria; labium rebordered (fig. 27). 27

25A Tarsi with single row of trichobothria, which often increase in length distally; trochanters not notched; usually in sheet webs with a funnel at one end . . . . . AGELENIDAE

25B Tarsi with numerous trichobothria, but irregularly placed; all trochanters notched (fig. 30). 26

26A Posterior row of eyes so strongly recurved (curved backwards at ends) that it appears to form two rows (fig. 28); median tarsal claw smooth or with a single tooth; egg sac carried attached to spinnerets, and young carried on mother's back . . . . . .LYCOSIDAE

26B Posterior eye row not forming two distinct rows, but only slightly recurved; median tarsal claw with 2 or 3 teeth; egg sac carried by chelicerae; young not carried by mother. . . . . PISAURIDAE

27A Clypeus in most spiders lower than height of median ocular area; eyes homogeneous; boss on chelicerae (fig. 29); mostly orb weavers. 28

27B Clypeus usually as high as or higher than height of median ocular area; eyes heterogeneous; chelicerae lacking boss; mostly not orb weavers. 29

28A Epigastric furrow between book lung slits procurved (ends curved forward); cheliceral boss rudimentary; in most specimens, chelicerae long and large; femora with trichobothria . . . . . .TETRAGNATHIDAE

28B Epigastric furrow nearly straight; cheliceral boss distinct and large (fig. 29); femora usually lacking trichobothria. . . . . .ARANEIDAE

29A Sternum broadly truncate behind; femur I about 3 times as thick as femur IV; legs lacking spines; weave modified by orb webs . . . . . THERIDIOSOMATIDAE

29B Not as in 29A; web not an orb web of any kind, but either a modified or an irregular sheet web (horizontal). 30

30A Tibia of male pedipalp lack apophysis; palp of female of most species with claw at end of tarsus; tibia IV of most species with 2 dorsal spines, or if only 1, then a short spine present on metatarsi I and II. . . . . LINYPHIIDAE

30B Tibia of male pedipalp in most species with at least one apophysis (fig. 4); palp of female lacking claw at end of tarsus; tibia IV with a single dorsal spine or bristle, and with all metatarsi spineless, or spines lacking altogether. . . . . ERIGONIDAE

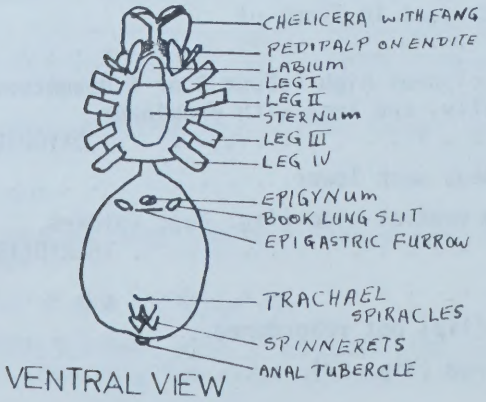


Figure 1. Ventral view of spider showing main features.

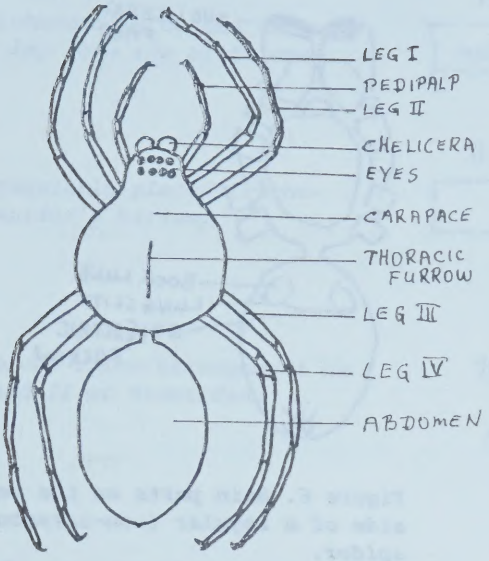


Figure 2. Dorsal view of a typical spider showing main features.

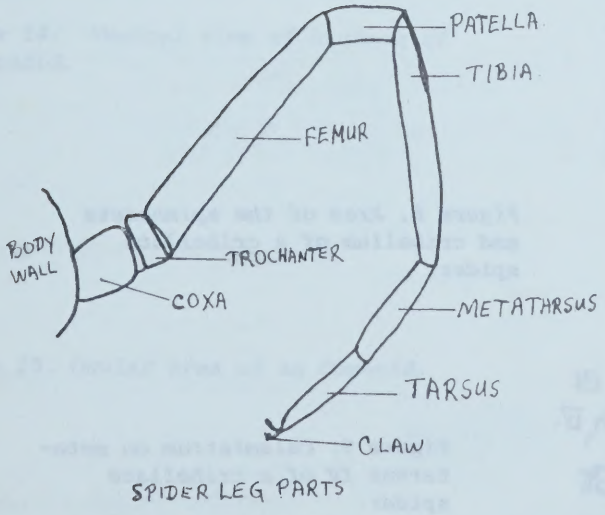


Figure 3. Details of the main parts of a spider's leg

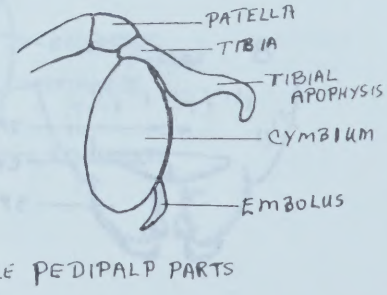


Figure 4. Main parts of the pedipalp of an adult male spider (details of the genitalia not illustrated).

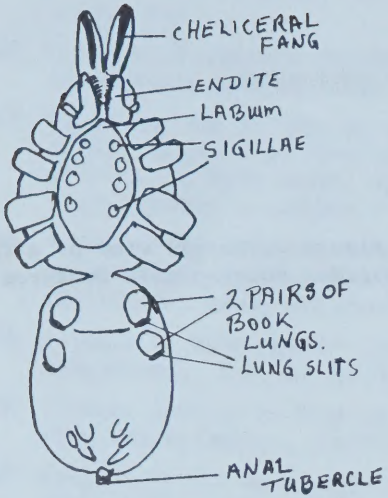


Figure 5. Main parts on the ventral side of a tarantula.

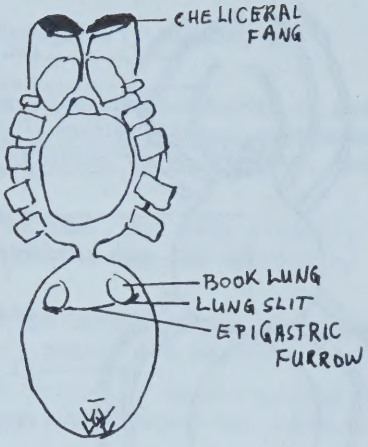


Figure 6. Main parts on the ventral side of a regular (non-tarantula) spider.

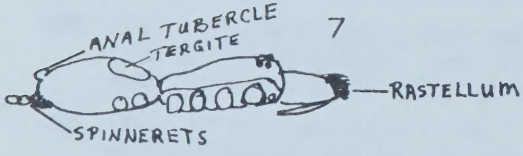


Figure 7. Lateral view of a tarantula.

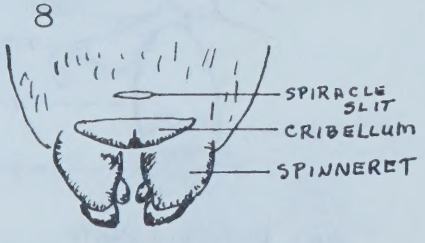


Figure 8. Area of the spinnerets and cribellum of a cribellate spider.

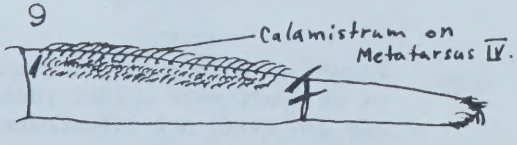


Figure 9. Calamistrum on metatarsus IV of a cribellate spider.

Figure 10. Trichobothria on the tarsus of a spider's leg (one row of trichobothria).

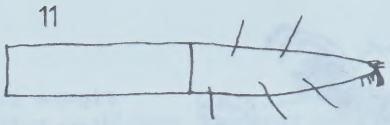


Figure 11. Irregularly placed trichobothria on a spider's tarsus.

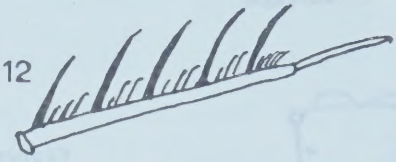


Figure 12. Typical spine arrangement on metatarsus I and II of Mimetidae.

Figure 13. Chelicerae fused together at base area, as in Scytodes.

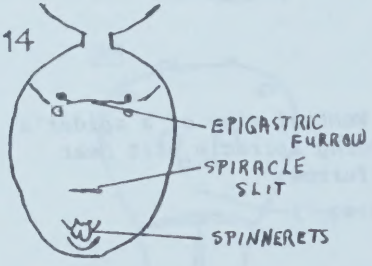


Figure 14. Ventral view of abdomen of a Scytodid.

Figure 15. Ocular area of an Oonopid.

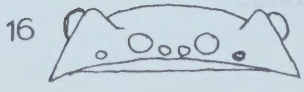


Figure 16. Ocular area of a Selenopid.

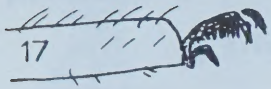


Figure 17. Tarsus showing 3 claws - two large and one small.

Figure 18. Tarsus showing 2 claws and claw tuft with scopula.

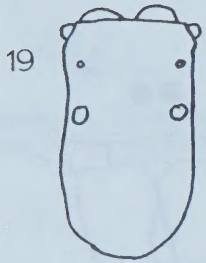


Figure 19. Ocular arrangement of a Saltidic.

Figure 20. Ventral view of a spider's abdomen showing spiracle slit near epigastric furrow.

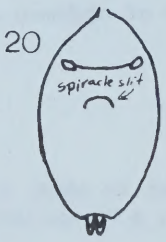


Figure 21. Ventral view of a spider's abdomen about midway between epigastric furrow and spinnerets.

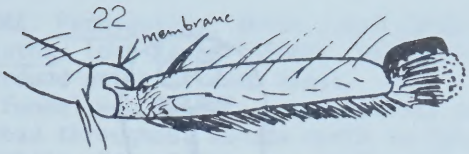


Figure 22. Membrane between tarsus and metatarsus of a Sparassid.

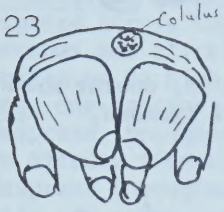
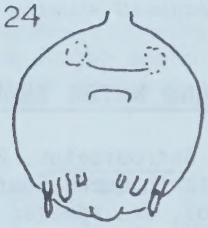


Figure 23. Area of spinnerets showing a colulus.

Figure 24. Ventral view of abdomen of a Hahniid, showing arrangement of spinnerets and location of spiracle slit.



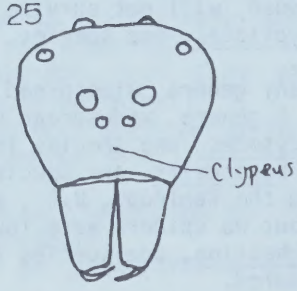


Figure 25. Front view of ocular area of an Oxyopid.

Figure 26. Lateral view of tarsus IV of a Theridiid, showing serrated ventral bristles.

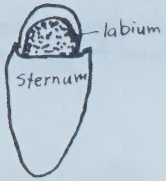


Figure 27. Ventral view of sternum and rebordered labium of spider.

Figure 28. Ocular area of a typical Lycosid.

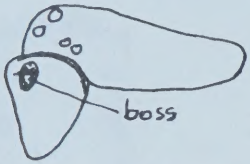


Figure 29. Lateral view of carapace and chelicera of an Araneid showing boss.

Figure 30. Ventral view of trochanter, showing the notch.

DISTRIBUTION AND NOTES ABOUT EACH SPIDER FAMILY

ANTRODIAETIDAE. Antrodiaetus, 2 species known, possibly 3, from south, central B.C., coastal north to Queen Charlotte Islands.
ATYPIDAE. Sphodros, one species known from southern Ontario.
THERAPHOSIDAE. Several genera introduced to Canada by pet shops for sale as pets. If turned loose, will not survive in Canada.
ULOBORIDAE. Hyptiotes, one species, from Nova Scotia and New Brunswick, British Columbia.
DICTYNIDAE. Many genera, widespread throughout Canada up to the high arctic islands.
AMAUROBIIDAE. 5 genera, widespread north to Yukon and Northwest Territories.
SCYTODIDAE. Scytodes, one species in Quebec, Ontario and Maritime provinces.
LOXOSCELIDAE. Loxosceles, one species imported regularly to Vancouver. Several persons bitten in the Kamloops, B.C., area were probably bitten by a member of this family, but no spiders were found. Bites cause necrotic lesions, sometimes death.
OONOPIDAE. Orchestina, one species from south, central British Columbia; rare, small pale-coloured.
TELEMIDAE. Known only from south, central British Columbia; small, rare; members of this family have no book lungs.
PHOLCIDAE. Pholcophora, one, possibly two species, from south, central British Columbia.
THERIDIIDAE. Many genera and species, widespread throughout Canada. Contains the Black Widow species.
LINYPHIIDAE. Widespread throughout Canada up to Yukon and N.W.T.; many genera and species.
ERIGONIDAE. Widespread throughout Canada up to high arctic islands; many genera and species; some call this family Micryphantidae.
THERIDIOSOMATIDAE. Theridiosoma, one species in Maritime provinces.
ARANEIDAE. Widespread throughout Canada, many genera and species, up to Yukon and N.W.T.; build the classical spider web.

TETRAGNATHIDAE. Pachygnatha, thick-jawed spiders, widespread across southern Canada; Tetragnatha, long-jawed spiders, many species up to Yukon and N.W.T., usually build around water or damp areas.
AGELENIDAE. Funnel web spiders, many species and genera, including introduced species, widespread throughout Canada north to Yukon and N.W.T.
HAHNIIDAE. Hahnia, Neoantistea, several small, delicate species, widespread up to Yukon and N.W.T.
MIMETIDAE. Ero, Mimetus, 2 genera, British Columbia, Alberta, possibly Ontario.
PISAURIDAE. Widespread across Canada in lakes and streams, where they often catch and eat small minnows and sticklebacks as food.
LYCOSIDAE. Widespread up to high arctic islands.
OXYOPIDAE. Oxyopes, one species, from southern Ontario and Quebec.
GNAPHOSIDAE. Widespread throughout Canada to Yukon and N.W.T. Many of these spiders can cause severe effects from bites in camping situations.
CLUBIONIDAE. Widespread throughout Canada to Yukon and N.W.T. The bite from some members of this family can cause severe reactions.
ANYPHAENIDAE. Anyphaena, 2 possibly 3 species, small spiders, known from British Columbia, Quebec, Ontario and possibly the Maritime provinces.
SPARASSIDAE. Heteropoda, one species commonly introduced on fruit from the tropics, and sometimes imported in personal baggage from tropical areas.
SELENOPIDAE. Selenops, one species regularly introduced in crates and personal baggage from tropical areas.
THOMISIDAE. Widespread throughout Canada to the Yukon and N.W.T. and high arctic islands. Catches prey by ambush.
PHILODROMIDAE. Ebo, Philodromus, Thanatus, Tibellus, many species, usually in hot, dry parts of Canada, though the latter two genera are found as far north as the Yukon.
SALTICIDAE. Many genera and species, widespread in Canada north to Yukon and N.W.T.

REFERENCES

Comstock, J.H. 1948. The spider book. Comstock Publ. Co., Ithaca, N.Y. 729 pp. [Well-illustrated]
Gertsch, W.J. 1949. American Spiders. Van Nostrand Co., Inc., Toronto. 285 pp., illus.
Kaston, B.J. 1978. How to know the spiders. Wm. C. Brown Co., publishers, Dubuque, Ia. 272 pp. [Well-illustrated, excellent for teachers and students]
Kaston, B.J. 1981. Spiders of Connecticut. State Geo. and Nat. Hist. Surv. of Ct. Bull. 70, Revised ed. 1020 pp. [Very well illustrated, very technical]
Lehtinen, P.T. 1967. Classification of the Cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha. Ann. Zool. Fenn. 4: 199-468. [Illustrated, very technical]
Levi, H.W. et al. 1968. Spiders and their kin. Golden Nature Guide, Golden Press, N.Y. 160 pp. [Illustrated, excellent for teachers and students]
Patent, D.M. 1982. Spider magic. Holiday House, N.Y. 40 pp. [Illustrated, excellent for students]

RAPTOR SIGHTINGS IN NORTHEASTERN ALBERTA DURING THE WINTER-EARLY SPRING PERIODS 1977 - 1982

by John R. Gulley
Boreas Environmental Consulting Services Ltd.
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Presented herein are the winter-early spring sightings of four species of raptors which the author has made in parts of northeastern Alberta (Boyle north to Fort McMurray). These sightings were made during trips from Fort McMurray to Edmonton and back. Sightings were not made during planned observation surveys but simply as the author passed through the area.

A. ROUGH-LEGGED HAWK

1980: March 29, 1 bird, Boyle area; December 2, 1 bird, Wandering River area. 1982: February 25, 1 bird, Boyle area; March 24, 1 bird, Boyle area, 2 birds, Wandering River area. This species winters fairly regularly in southern Alberta (Sadler and Myres 1976). Sightings north of Edmonton are not very common.

B. BALD EAGLE

1979: January 30, 1 bird, Wandering River area. 1980: February 27, 1 bird, December 2, 1 bird, both in Wandering River area. 1981: January 15, 1 bird, Wandering River area.

C. NORTHERN HARRIER - EARLIEST SPRING SIGHTINGS

1977, April 9, Wandering River area; 1978, March 28, Wandering River area; 1979, March 22, Wandering River area; 1980, March 29, Wandering River area; 1981, March 24, Wandering River area. Note: I was not in the area during the spring of 1982. Sadler and Myres (1976) note that the first spring migrants usually are recorded in the last half of March or the first week of April. Most of the late March sightings are from southern Alberta. The area in which these sightings were made is the northern edge of agricultural land in this part of Alberta.

D. HAWK OWLS - SUMMARY OF TOTAL NUMBER OF BIRDS SIGHTED IN THE BOYLE TO FORT MCMURRAY AREA DURING THE WINTERS OF:

1978-79: 42 owls sighted during 13 trips, October 27-April 25. Highest single trip total, 9 on December 5. 1979-1980: 8 owls sighted during 9 trips, October 27-February 27. 1980-1981: 1 owl sighted during 9 trips, November 10, 1980. 1982-1983: no owls sighted during 6 trips to date (March 7, 1983).

LITERATURE CITED

Sadler, T.S. and M.T. Myres. 1976. Alberta birds, 1961-1970, with particular reference to migration. Prov. Museum of Alberta natural history Occasional Paper No. 1. 314 pp.

PORCUPINE WITH MANGE

by Harry Young
R.R. #1, Busby, Alberta TOG OHO

On February 26, 1983, I found a porcupine walking across a hay field which apparently had mange. Its back, rump and hind legs were without quills or guard hairs and covered with festering sores.

Mange has been present in the local coyote population for several years now. I am familiar with the appearance of the disease in coyotes, and am quite sure this porcupine did, indeed, have mange. Although the animal was a fully-grown adult, it was extremely emaciated. An adult normally weighs up to 25 pounds, but I doubt if this individual weighed much more than 12-15 pounds. I have never seen a mangey porcupine before, and would be interested in discovering how common an occurrence it is.

NATURALISTS' BOOKSHELF

MOSS FLORA OF THE MARITIME PROVINCES

by Robert R. Ireland. 1982. 738 pp. Publications in Botany No. 13. National Museum of Natural Sciences, Ottawa.

This manual treats the moss flora of Canada's three Maritime provinces, namely, New Brunswick, Nova Scotia and Prince Edward Island. The manual includes 381 species, listed in systematic order by family. (The Alberta moss flora is in the area of 500 species.) Included in the text is introductory information on the structure and life cycle of mosses, collecting and herbarium techniques, identification and methods of study, reference books and a discussion on nomenclature and classification. Keys are provided for the genera and species. Each genus is fully described, while brief descriptions are provided for the species, followed by information on habitat, Maritime distribution, species range and other relevant remarks. The back of the book has a fully-illustrated glossary.

In my work I have the need and opportunity to consult many floras on bryophytes. What immediately appealed to me about this flora were the numerous and high quality illustrations and the excellent illustrated glossary. Making habitat sketches of plants as tiny as some of the mosses is no easy task. Anne Hanes, Linda Ley and Gilda Bellolio-Trucco are to be highly commended for their excellent illustrations.

One task of a reviewer seems to be to find fault with whatever is being reviewed. In the case of Moss Flora of the Maritime Provinces this is not easy. It comes across as a thorough, well prepared and presented text, with few obvious errors. Wetland ecologists will cringe at the use of the phrase "boggy habitat" in the definition of a fen and the sweeping statement that poor fens are "floristically similar to true bogs, but richer in species" (this is quite untrue), but on the whole the glossary appears to be fairly complete and descriptive, although at times it is rather technical for the novice. Deficiencies in keys are usually only found after extensive and comparative usage. A few trial identifications did not reveal any obvious problems with the keys.

Although the manual deals only with Canada's Maritime provinces, it will prove quite useful even in the study of Alberta's mosses as there are many species common

to both regions. Unfortunately, the size of the book does not lend itself to portability as far as a field manual goes, but I would heartily recommend it as a reference or introductory text. It is one of the best books of its type that I have seen.

- J. Derek Johnson, Northern Forest Research Centre, 5320 122 St., Edmonton, AB T6H 3S5

A BIRD-FINDING GUIDE TO ONTARIO

by Clive E. Goodwin. University of Toronto Press, Toronto. 248 pp. $12.50.

There is nothing more frustrating for the novice birdwatcher than not knowing where to go to see birds. In beginning birdwatching courses, you often hear the question, "Where do you go birdwatching?" The same applies to experienced birders when they are in an unfamiliar area. To this you might say, "Well, birds are everywhere!" and indeed they are. However, as experience will show, some areas are much better than others. One of the tricks to consistently successful and exciting birding is to know the whereabouts of these 'good' areas. Enter the 'bird-finding guide'.

A Bird-Finding Guide to Ontario is one of the latest entries in this field and one of the only province-wide guides. Its purposes as described by Mr. Goodwin are: (1) to meet the growing demand across North America for bird-finding guides; and (2) to provide directions to the best known localities. The book is very well laid out: the first section (Chapters 1 and 2) gives general information on Ontario birds and their status in the Province; Chapters 3-8 give directions on how to get to certain birding areas within various regions of Ontario; the last two chapters give information for visitors and seasonal systematic lists. The bulk of the book is contained in the second section. Each of those 6 chapters begins with a map of the region showing the locations of all sites discussed, indicated by number. A short introduction discusses the region, giving breeding birds that are more or less unique or which may reach the northern or southern limit of their breeding range within that region. The rest of each chapter consists of an alphabetical listing of the sites and how to get to them. One must be impressed with the number of specific sites covered: 217 in total. It is also a credit to the author to have most, if not all, the sewage lagoons in Ontario included.

My major criticisms of A Bird-Finding Guide to Ontario lie with what is missing rather than with what is presented. First, the narrative that goes with some of the sites is amazingly brief. For example, the entire entry for Thedford consists of one sentence, "The sewage lagoons are on the right, driving west on Highway 82, just 1/2 km after the long curve to the left leaving the village". There is no mention of whether the area is good for birds (some sewage lagoons are not) or of what to expect when you get there. A quick tally shows that about 18% of the site entries consist of similar one or two-sentence descriptions of how to find the site.

My second criticism of the book, and I feel this is more serious, is that for many sites Mr. Goodwin fails to mention any, or at most only a few of the birds that can be found there. Again, an example can be taken directly from the text in the description for Guelph. Guelph is a large town of 70,000 people. In the guide it is allotted 2-1/3 pages - a reasonable allotment of space. However, a total of only five bird names are mentioned in the entire section. The same is true for about 40% of the sites listed. Given only pages and pages of directions, the reading is both boring and tedious. In a nutshell, it is heavy on "where" but very light on the "what" of birding in Ontario. To be fair to the author, however, he does not anywhere state that his book is a guide to the birds that will be found at birding sites, but rather "Where the birds are and how to get there". However, I think in preparing good bird-finding guides, authors have a responsibility to provide this information for the sites they describe.

Finally, and this is true of many bird-finding guides, some significant birding areas have been missed or omitted. Even within the limited area of south-central Ontario with which I may be qualified to comment, the communities of Barrie, Orillia and Owen Sound are not mentioned. All three are located adjacent to or near large water bodies and get significant seasonal populations of birds.

This book represents a vast improvement over what was available prior to 1982. I think for most birders, when travelling about Ontario, this book ranks right behind their field guides as the one or two books to take birding.

- D.V. (Chip) Weseloh

PRAIRIE GRASSES, IDENTIFIED AND DESCRIBED BY VEGETATIVE CHARACTERS

by Jan Looman. 1982. 224 pp. Publication 1413. Agriculture Canada, Ottawa. $9.95 paper.

This edition is a reprint and enlargement of the 1971 edition by K.F. Best, Jan Looman and J.B. Campbell which was a revision of a publication which originally appeared in 1944. The 1982 edition has added three new species to the 1971 listing, for a total of 107.

The outline of the publication is virtually identical to that of the 1971 edition, with two sections. The first section begins with a description of the grass plant, including line drawings and illustrating various features and concludes with a bibliography and a glossary. The second section, which comprises most of the book, begins with a note on how to identify a grass, followed by the vegetative character key. The majority of the section is devoted to descriptions of the various species, including good line drawings of each, as well as relevant information such as growth habit, where found and other similar species. The listing of species is alphabetical by botanical name. The most frequently used common names are also given.

Since more often than not, a person is confronted with trying to identify a grass in sterile or less than prime condition, a book such as this, using a key based on vegetative characters, fills a definite need. The descriptions, line drawings and glossary provide a good understanding of the structure of a grass plant and together with the keys a person should be able to identify any of the species found in the book with a minimal loss of sanity.

My major concern with the new edition is that the scientific names of a number of species have been changed from the earlier editions with no reference whatsoever as to where or why this was done. Presumably it was done to keep the nomenclature current with Budd's Flora of the Canadian Prairie Provinces, but those with the older editions of the book can only be confused by these unreferenced changes. It would have taken minimal effort to include cross-references to synonomy. Also, a number of the "similar species" included in the 'Remarks' section of the descriptions no longer appear in the Index as they did in the earlier edition. This appears to have been done quite deliberately, but one would ask why.

Despite these few quirks which have appeared in the latest edition of Prairie Grasses, it remains a good and inexpensive reference to start with if one is interested in the identification of some of our more common grasses.

- J. Derek Johnson, Northern Forest Research Centre, 5320-122 St., Edmonton, AB T6H 3S5

TWO IN THE BUSH

by Rosemary Gaymer. Illus. by E.B. Sanders. 1982. Consolidated Amethyst Communications Inc., 60 Barbados Blvd., Unit #6, Scarborough, Ont. M1J 1K9. 103 pp, softcover. $7.95.

Rosemary Gaymer's introduction to bird-watching was in England where she had a bird feeder outside her bedroom window. The consequent close contact with individuals of familiar species led to her interest recording deportment, behaviour and plumage variations rather than listing bird species.

Since coming to Canada in 1955, she has travelled widely in North America, taught college courses in bird study, been President of the Toronto Field Naturalists' Club, and a member of the board of the Federation of Ontario Naturalists.

Her well-written anecdotes and detailed observations of nature make delightful and informative reading. The sketches at the beginning of each short section make the book attractive but I found the few full-page illustrations too harsh to be pleasing. This book provides a pleasant couple of hours of easy reading, would make a good small gift or introduce a young naturalists (12 years and up) to the art and joy of really watching birds.

- Dorothy Dickson, 231 Scarboro Ave. SW., Calgary, AB T3C 2H4

A FLORA OF WATERTON LAKES NATIONAL PARK

by Job Kuijt. 1982. 684 pp. The University of Alberta Press, Edmonton. $25.00 cloth (out of print); $21.00 paper.

Waterton Lakes National Park holds a unique position in the geography of Alberta. Not only is it one of the more picturesque areas of the province, but the diversity of flora in an area less than 520 sq. km. in size is truly amazing. Over one half of the vascular plants found in Alberta can be found in the Waterton area, which comprises only about 0.1% of the total area of the province.

The author, Job Kuijt of the University of Lethbridge, has spent many years working in southern and southwestern Alberta and his love and fascination with the area comes through in the flora. However, this reviewer was rather disconcerted by the organization of the flora which is strictly alphabetical by family name. Finding the pines sandwiched somewhere in between the orchids and ferns was a bit of a jolt. Setting aside personal preference, once one is aware of the arrangement of the flora, it is a rather straightforward process to locate the families. However, it would have been a great help and timesaver if page numbers had accompanied family names in the introductory key and family names had appeared at the top of each page. It is an inconvenience to keep flipping back and forth to the Index.

It would have been good if the author had included an expanded Bibliography covering other aspects of the geography, ecology, flora and fauna of this most fascinating area. Many aspects besides the vascular flora deserve more than the passing mention he gives them. Also, inclusion in the keys and descriptions of some of the plants found in nearby areas, but not in the park itself, should have been considered. This would have added to the value of the flora.

Almost all the species listed in the flora are illustrated, with most of the line drawings being done by the author himself. The quality is generally excellent, but some concerns are evident. It is not easy to do habit sketches of some of the smaller plants to scale and a few of the drawings are of limited value in confirming an identification. This is a very minor problem. My major criticism of the illustrations is the clutter on some of the plates, especially in the case of the sedges. It is not always

clear which leaves or flowers belong to which plant and this can become rather confusing. But on the whole, the illustrations aremost helpful with many diagnostic features being shown. The illustrations will be appreciated by many and are a great asset to a flora of this type.

The minimal use of technical language in the text will come as a relief to almost everyone. Where it is used, it is generally well explained in the glossary. Considering that the flora is intended for a broad audience, I found it surprising that the author did not make greater use of common names.

It is a pleasure to see such a high quality publication and the author deserves high praise for completing it. The flora will stand well on its own. Perhaps more importantly to those interested in the vascular plants of Alberta, it will become an excellent companion volume to the forthcoming revised edition of the Flora of Alberta which unfortunately will not include illustrations.

- J. Derek Johnson, Northern Forest Research Centre, 5320-122 St., Edmonton, AB T6H 3S5

FISH AND WILDLIFE POLICY FOR ALBERTA

Alberta Energy and Natural Resources, Fish and Wildlife Division. October 14, 1982. 24 pp.

A policy for the management of fish and wildlife by our Fish and Wildlife Division should be a desirable objective. This document, however, is ill-conceived and should be withdrawn and drastically re-written.

Basic to any stewardship of a public renewable resource such as fish and wildlife is the concept of habitat in which populations of animals necessarily live, and how to maintain habitats as livable environments for them. There are few policies that bear on this vital question in this document. I looked, almost in vain, for statements of principles for habitat conservation, maintenance or enhancement. The word 'habitat' appears, I believe, only in the former Associate Minister's foreward ("Fish and wildlife were, and still are, dependent upon habitat"), and in one other place where, as part of a 'comprehensive' 10-year outdoor recreation plan, it is stated that "this plan should address such items as": A description of the habitat base necessary to achieve fish and wildlife resource supply requirements. (Outdoor Recreation Policy, clause 4(d)).

Species conservation is not mentioned. However, there is a clause that could be read to mean that public access to rare species is advocated as a planning priority! (Outdoor Recreation Policy, clause 3(c)). Rightly or wrongly, I have concluded after reading this document that it was not written by people with any knowledge of wildlife or fisheries biology; it is inconceivable that biologists could have prepared a policy that is not apparently concerned at all with established ecological principles that have formed the foundations of wildlife and fisheries management for years.

It was alarming to this reader when he also began to realize that there is a pervasive thread running through this 'policy' for our fish and wildlife in Alberta, namely that it is viewed by the Department of Energy and Natural Resources as primarily serving a role in human economic affairs. Fish and wildlife are not presented as having any value in themselves at all, or as constituting a heritage of all Canadians, not just Albertans. This is a chauvinist political document, in fact, that overtly goes out of its way to distinguish Albertans from their non-resident neighbours, both north and south of the U.S. border. Thus: "It is important to clarify that the Division is not providing wildlife use opportunities such as hunting, viewing and photography to non-residents for their recreational enjoyment per se, but rather the Division will promote use opportunities to tourists for the economic benefit of Albertans. . ." (Wildlife Policy, clause 22), and "General Tourist use of wildlife will be encouraged as long as it can be demonstrated that there are clear economic benefits accruing to Albertans"

(Wildlife Policy, clause 22(a)(ii)). Similar wording appears in the Fisheries Policy, clause 15. These are wordings that are almost designed to insult other Canadians as well as foreigners. It is a gratuitously selfish policy declaration. If this government policy is to be taken seriously, we clearly live in a banana republic. Are Albertans no longer mature people with a benign attitude to their neighbours and a burning desire to show off the beauties of this province to anyone who can be persuaded to visit here?

The document exhibits other signs of having been prepared primarily for economic and political (rather than biological) reasons. An attempt is made to satisfy some of the claims of Alberta's Indians and Metis, and others living in remote areas (Wildlife Policy, clauses 15, 16 and 19; Fisheries Policy, clauses 4, 5 and 16). The complaints of recreational fishermen about commercial fishermen have also been addressed in the Fisheries Policy (clause 6(b)). What may be really objectionable is that would-be free enterprise exploiters of our wildlife and fish are handed a variety of new and controversial ways in which to corner a market in publicly-owned resources. For example, "The Division will encourage an environment which fosters the development of a domestic wildlife farming (or game ranching) industry on private land and Metis Settlements." (Wildlife Policy, clause 23 (with clause 24's similar proposal shown in brackets)). Likewise, shooting preserves on private land are to be encouraged (Wildlife Policy, clause 21(d)). Perhaps the most blatant example is that Tourist Lodges and Outfitters have apparently been assured of exclusive rights to fishing or hunting in certain areas: "Formally allocating wildlife to tourist lodge and/or outfitter use" (Wildlife Policy clause 22(b)(ii)(a)) and "Formally allocating the fisheries resource to tourist camp and/or lodge use" (Fisheries Policy, clause 15(b)(ii)(a)).

Wildlife Policy clause 7 apparently contains approval of the collecting of reptiles and amphibians for profit, which must be totally unacceptable: "The Government recognizes the legitimacy of consumptive uses of wildlife including, but not limited to, recreational hunting, falconry, trapping, and amphibian and reptile collecting." This fails to recognize that we have rather few species of amphibians and reptiles in Alberta, that most of these are at or near the edges of their ranges, and that several are quite uncommon and probably could quickly become threatened if collected commercially. I have also just learned that falconry in Alberta was legalized in 1982, despite a general opinion that it should remain illegal. My own opinion has been that falconry could be legal without undue harm to the species concerned, but only under stringent and detailed regulations and only if the province is prepared to spend more money than it would be willing to do in these uncertain times on enforcing these regulations in the field. It is evident that the Government of Alberta has been subjected to, and has given way under, pressure from a variety of special interests, without any responsible consideration of the long-term interests of the resource species concerned or the overall public interest.

The theme of privatization runs all through this document, as when it states that: "The role of government will be restricted to those things which clearly can be achieved only through government." (Wildlife Policy, clause 2(c); Fisheries Policy, clause 2(c)). This could easily be interpreted to mean that the traditional research and management functions of the Fish and Wildlife Division will be contracted out in future to the private sector, i.e. that the only remaining role for the Fish and Wildlife Division will be as a paper-pushing bureaucracy issuing licences. It is hard to imagine where this would ultimately lead. The extent to which public management of a public resource could be discontinued is not clear, and such a development would be completely unacceptable.

This is, then, not a Policy for fish and wildlife in Alberta, but instead a Policy for legitimizing and regulating the further exploitation of fish and wildlife by some Albertans to the exclusion of others, or by an entrepreneurial class of Albertans with special privileges. It appears to be a dramatic shift of viewpoint from the

traditional one that wildlife and fish are the common heritage of the people of a province. When private business interests are granted the power to influence the governance of the electors of a province, the Government loses its legitimacy, and this "Fish and Wildlife Policy" appears to be a politically-dictated document. It gives no consideration to what may be best for the animals involved, and naturalists and sportsmen should reject it in its present form as a blatant expression of the intrusion of private commercial interests on a large scale in to what has been a public property. While each proposal might be discussed on its merits, perhaps before well-advertised open public hearings by the Environment Council of Alberta, the putting of this policy in place appears to be a crude attempt to circumvent the genuine public hearing procedure, which can work so well to education public opinion and achieve concensus. Private consultations with special interest groups are no substitute for the open forum that has been widely advertized well in advance.

I am afraid that this policy is a dangerous lapse in the Alberta Government's role in "Managing the Commons". The government should never abrogate its responsibility to manage our fish and wildlife resources wisely.

- M.T. Myres, University of Calgary

RECENT PUBLICATIONS ON THE NATURAL HISTORY OF ALBERTA

Compiled by David M. Ealey and Martin K. McNicholl

Anonymous. 1982. Winter Olympics 1988. Park News 18(4): 35. - resolution of NPPAC

Anonymous. 1983. Field sightings. Edmonton Bird Club Newsletter March 1983: 4.

Anonymous. 1983. Lights, camera, Kitsim. Conservator 4(1): 4. - making a movie of a marsh at Kitsim, Alberta

Anonymous. 1983. Three part harmony at Beaverhill Lake. Conservator 4(1): 6-7.

Anonymous. 1983. Will Olympic events have environmental impact? West. Can. Outdoors 7(1)

Barron, J.R. and G.S. Walley. 1983. Revision of the Holarctic genus Pyracmon (Hymenoptera: Ichneumonidae). Can. Ent. 115: 227-241.

Blais, J.A.R., G.D. Lodwick and R. Ferland. 1983. Gravimetric terrain corrections in western Canada. Can. J. Earth Sci. 20(2): 259-265.

Boxall, P.C. and M.R. Lein. 1982. Are owls regular? An analysis of pellet regurgitation times of Snowy Owls in the wild. Raptor Res. 16: 79-82.

Clayton, P. 1983. Urban magpies. Edmonton Nat. 11(1): 10-11.

Collister, D. 1983. Bird highlights - Calgary-December 1982. Calgary Field Nat. Newsletter 4(6): 1-2.

Collister, D. 1983. Bird highlights-Calgary-January 1983. Calgary Field Nat. Newsletter 4(7): 1.

Collister, D. 1983. Bird highlights-Calgary-February 1983. Calgary Field Nat. Newsletter 4(8): 1.

Copland, H.W.R. 1983. Prairie Nest Record Scheme 1982. Man. Mus. of Man & Nature, Winnipeg. 5 pp. MS rept.

Dickson, D. 1983. Wolves and caribou. Pica 4(1): 38-42.

Ebel, G.R.A. and M. Cox. 1983. Breakfast with the gulls: Clover Bar Disposal site. Birding around Edmonton ser. Booklet No. 2. Edmonton Bird Club, Edmonton. 4 pp.

Emerson, D. 1983. Late glacial molluscs from the Cooking Lake moraine, Alberta, Canada. Can. J. Earth Sci. 20(1): 160-162.

Fast, D. 1983. Bird news. Man. Nat. Soc. Bull. 6(5): 8-9. - reports without details of a sighting of a Scissor-tailed Flycatcher in Alta. by Phil Horch.

Fox, R.C. 1983. Evolutionary implications of tooth replacement in the Paleocene mammal Pararyctes. Can. J. Earth Sci. 20: 19-22.

Gollop, J.B. 1982. Prairie Provinces Region - the nesting season: June 1-July 31, 1982. Amer. Birds 36(6): 988-990.

Halliday, I. 1983. Christmas bird count reports. Calgary. Calgary Field Nat. Newsletter 4(6): 2.
Hancock, L. 1983. River of no return. Nat. Can. 12(1): 4-11.
Horn, W. 1983. Birding Alberta Beach and area. Birding Around Edmonton Ser. Booklet No. 3. Edmonton Bird Club, Edmonton. 4 pp.
Houston, C.S. and M.J. Bechard. 1982. Edward Arnold, enthusiastic oologist. Blue Jay 40: 184-192.
Innes, D.G.L. and J.S. Millar. 1982. Life-history notes on the Heather Vole, Phenacomys intermedius levis, in the Canadian Rocky Mountains. Can. Field-Nat. 96(3):307-311.
Johnston, S. 1983. Christmas bird count reports. Wildlife Reserve of Western Canada. Calgary Field Nat. Newsletter 4(6): 2.
Johnston, S. 1983. Christmas bird count reports. The Snakes Head, Alta. Calgary Field Nat. Newsletter 4(6): 2.
Kure, E. 1983. Wolf predation. Western Can. Outdoors 7(1): 8.
Landals, A. 1983. Goshawk vs. hare. Edmonton Nat. 11(1): 12.
L'Hirondelle, S. 1983. Vegetation of saline sloughs in central Alberta. Edmonton Nat. 11(1): 4-9.
Mair, S. 1983. The mice, voles and rats of southern Alberta. Pica 4: 24-37.
Mychajluk, M. 1983. The birds of the Albert Park fields. Pica 4: 11-13.
Masner, L. 1983. A revision of Gryon Haliday in North America (Hymenoptera: Proctotrapoidea:Scelionidae). Can. Ent. 115: 123-174.
Mirza, C. 1983. Soft zones in the glacial till in downtown Edmonton: discussion. Can. Geotech. J. 20(1): 193-194.
Packer, J.G. 1983. Flora of Alberta: Sparganium angustifolium and Erigeron trifidus. Can. J. Bot. 61:359-366.
Parsons, Dr. Bill. 1983. Feeding the birds. Cent. Alta. Nat. No. 5:8.
Peach, J. 1983. Calgary's river islands. Pica 4(1): 6-8.
Powell, J.M. 1982. Rodent and lagomorph damage to pine stem rusts with special mention of studies in Alberta. Can. Field-Nat. 96(3): 287-294.
Pritchard, G. and P.J. Scholefield. 1983. Survival of Aedes larvae in constant area ponds in southern Alberta (Diptera:Culicidae). Can. Ent. 115:183-188.
Reynolds, B. 1983. Giving thanks to the birds. Nat. Can. 12(1):39-40.
Robertson, I.D. 1983. Wood Buffalo National Park management plan position. Natl. & Prov. Parks Assoc. of Can. Edmonton Chapt. Newsletter 14(1): 5-6.
Ross, D. 1983. Magpies. Edmonton Nat. 11(1): 10-11.
Rothfels, M. and M.R. Lein. 1983. Territoriality in sympatric populations of red-tailed and Swainson's hawks. Can. J. Zool. 61(1): 60-64.
Samuel, W.M., E.S. Williams and A.B. Rippin. 1982. Infestations of Piagetiella peralis (Mallophaga:Menoponidae) on juvenile White Pelicans. Can. J. Zool. 60:951-953.- mostly Saskatchewan but includes record of infestation at Wadlin Lake, Alta.
Schueler, F.W. 1982. Sexual colour differences in Canadian Western Toads, Bufo boreas. Can. Field-Nat. 96(3):329-332.
Schutz, Fred. 1983. A natural history feature: the northern timber wolf. Cent. Alta. Nat. No. 5:4-5.
Shultis, J. 1982. Two hundred bison to be sold by public tender. Park News 18(4):38.
Shultis, J. 1982. Long-range development proposals for Lake Louise ski area. Park News 18(4): 38-39.
Shultis, J. 1982. "Beaver fever." Park News 18(4):39. - Banff Natl. Park.
Siferd, T.D. 1982. Mink, Mustela vison, attacks Trumpeter Swan, Cygnus buccinator, cygnet. Can. Field-Nat. 96(3):357-358.
Spencer, A.N. 1983. Slave River hydroelectric power development. Natl. & Prov. Parks Assoc. of Canada Edmonton Chapt. Newsletter 14(1): 7-9.
Stiles, D. 1983. 1982 Calgary area bluebird trail results. Pica 4: 16-23.
Stiles, D. and G. Neill. 1983. Double broods of tree swallows in one nest box. Pica 4:9.
Stiles, D. and G.P. Neill. 1983. Alberta has two cases of double broods of tree swallows in single nestboxes. Sialia 5:6.
Wiseley,A. 1983. Kananaskis Country peregrine releases 1982 summary. Pica 4:14-15.

FAN NEWS

FAN SUMMER FIELD MEETING

The July 16-17 F.A.N. field meeting will be held in the Crowsnest Pass and is being hosted by the newly-formed Crowsnest Pass/Elk Valley Naturalists' Society. Meet at Lundbreck Falls at the falls itself on Friday evening between 6 and 11 pm, or on Saturday 10:00am - 1:00pm and 2:30pm - 3:00pm. Lundbreck Falls is located on Highway #3 approximately 10 miles west of Pincher Creek. Although there are Provincial campgrounds in the area, arrangements have been made to camp on private property. The camping area is quite primitive (no bathrooms or other services). Individuals must supply their own food and accommodation (campers, tents, etc.). Motel accommodations are available at Bellview, about 12 miles from the camping area. Directions to the camping area will be given at the Falls.

Field trips are planned and include a tour of Line Creek Coal Mine. The Saturday evening program will feature speakers on either mountain pine beetles or coal mine site reclamation (or both). On Sunday, the final field trip will be a car caravan onto the prairies, on route home for visitors from the north. Saturday evening we will have an open-fire cookout, so bring weiners and other picnic paraphernalia.

For further information phone Clayton Truman, 564-5180, or Michael O'Shea, 329-3356 (home), 329-5511 (work).

FAN FALL MEETING

The fall FAN meeting will be held at the Bow River Senior Citizens Lodge at Canmore, with a theme "The Canmore Corridor: Land Use in Transition", September 17 and 18. On Saturday, September 17, registration is between 9 and 10 am at the Lodge, followed by a field trip to the Kananaskis Valley (which coincides with the Board of Directors' Meeting), 10 am to 5 pm. Another field trip, from 1:00 pm to 5:00 pm will leave from the Lodge to one of the side canyons of the Bow River. At 5:00 pm we will share the evening meal with the residents of the Lodge (please pre-register; a fee of $5.00 will be collected at the door). At 7:00 pm the evening program will feature "The Canmore Corridor - Past, Present, Future" with Bob Smith, a Canmore resident, long-time FAN member and well-known nature photographer and photography instructor. This will be followed by a panel discussion.

On Sunday morning at 6:30 am an early morning bird walk will be conducted, followed by a field trip to Wind Valley and Wind Ridge at 9:00 am. The environs of Wind Creek contain some of the most valuable wildlife habitat in the entire region. We will visit some of the prime elk and mountain sheep ranges and look at the areas proposed for massive recreational development by Patrician Land Co. We will also know by then whether this area may be developed for the nordic events of the 1988 Olympics.

The meeting place for field trips will be the parking lot of the Lodge. Campsites are available at the provincial areas along the Bow River east of Canmore and at the Restwell Trailer Park in town. Motel accommodation is readily accessible on the outskirts of Canmore. We are fortunate to be able to use the Bow River Lodge as our meeting place. This will be a good opportunity to meet the residents, many of whom are very much a part of the history of this area.

The Canmore Corridor was at one time part of Banff National Park and is an important gateway to the mountain parks, to the prime recreational areas of Kananaskis Country and to many fascinating and relatively undisturbed natural areas north of the Bow River including the Yamnuska. It is a region of great beauty, rich in natural resources, and the focal point of many of the kinds of land use conflicts with which

Albertans are so familiar. All FAN members are invited to visit, experience and learn more about this significant region of the southern Rockies.

The Bow River Senior Citizens Lodge is at 920 - 13 St. It can be reached by driving the Main Street of Canmore to the four-way stop and turning right.

PRE-REGISTRATION: All persons interested in the Saturday evening supper at the Lodge please pre-register in writing to the Bow Valley Naturalists, Box 1693, Banff, AB TOL OCO (or phone Mike and Diane McIvor at 674-4160, evenings). A fee of $5.00 will be collected at the door. We must have an idea of numbers by early in the week of the meeting.

CLUB NEWS

BOW VALLEY NATURALISTS

During the last year, BVN members participated in a wildlife transect study with the Warden Service to determine the movement and numbers of large animals in the lower Bow Valley. On Dec. 4 over 20 BVN members followed mapped transect routes to count and identify animal tracks. The following week the wardens flew over the same routes to do the same.

BUFFALO LAKE NATURALISTS

Among the highlights of an ambitious 1983 program are field trips to the Ellis Bluebird Farm, Miquelon Lake, Gooseberry Lake in the Neutral Hills country, and a hamburger cookout. Upcoming events include a Red Deer River overnight canoe trip (Sept. 3-5), a trip to Drumheller (Sept. 18), with regular meetings September 15 ("Bring a Friend Night"), October 20 and, the last of the year, November 17.

CALGARY FIELD NATURALISTS' SOCIETY

At our February meeting we were pleased to welcome Alderman Jack Long to discuss city planning and Calgary's natural areas. In March Murray Anderson (Forest Service) talked on range management in the Eastern Slopes with particular reference to 'wild' horses and in April Brian Keating (Education Officer, Calgary Zoo) gave an illustrated talk on his recent trip to see the wildlife of Zimbabwe. In May Rick Revel will speak on the effects of seismic cutlines in our boreal forests and in June, we hope to combine our AGM with an art show and sale by Robert Fisher.

As requested by FAN we have sent a critique of the Fish and Wildlife Policy to Don Sparrow, Minister. A representative of CFNS attended a meeting on the policy called by the Calgary Humane Society and four of our directors have met with the Assistant Deputy Minister, Dennis Surrendi. Both he and the Minister have assured us that we will be sent a draft of the Management Plan designed to implement the policy and address the ecological concerns we have raised. However, as this plan has to go to caucus and we are told that the policy was written the way it is in order to get it through caucus, things don't look too hopeful! In any case it would seem dangerous to have all the 'exploitation' in the fixed policy and the 'ecology' in a more easily changed management plan. It is obvious that if this highly political and unscientific policy is to be changed it will take a lot of pressure from naturalists so we hope other clubs have also sent Don Sparrow (not just Surrendi) their comments and are being persistent in their follow-up.

- Dorothy Dickson

EDMONTON NATURAL HISTORY CLUB

The April meeting featured a most interesting and informative talk by Dr. Dick Russell of the Canadian Wildlife Service on the project to reintroduce the swift fox to Alberta. At the May meeting Dr. Linda Fedigan of the University of Alberta Anthropology Department gave a wide-ranging presentation on some of our close relatives, the apes and monkeys. Regular meetings will resume in September, held the second Tuesday of the month at 8:00 pm in the auditorium of the Provincial Museum.

Over $200.00 was raised to help the club at a bake sale held at one of the Edmonton shopping malls in early March. The annual spring birding pilgrimage to Beaverhill Lake with the Edmonton Bird Club was held on April 17. Weekend camping field trips are planned to the Westlock-Barrhead area for the first weekend in June and to Sir Winston Churchill Provincial Park near Lac la Biche the last weekend in June.

- J. Derek Johnson

RED DEER RIVER NATURALISTS

1982 was, again, an ambitious year for the RDRN. Highlights among evening programs included: Dick Mountain of Innisfail with a slide presentation about the Gallapagos; a presentation about a canoe trip over the Great Divide above the Arctic Circle by John Vleheck and Faye Hallet; wildflowers with Jim Posey; Willmore Wilderness Area with Vivian Pharris; and a naturalist's view of Australia with the Fabris family.

Protection of the Gaetz Lake Sanctuary, long a focal point of RDRN efforts, seems secure now, as title to the property has been transferred to Waskasoo Park with the caveate that the sanctuary shall remain primarily for the protection of wildlife in natural habitat and no activities shall be permitted that will disturb this objective.

NOTES AND NEWS

("Notes and News" is somewhat dependent upon reader contributions. I would welcome any newspaper clippings, magazine articles, or copies of other appropriate material you may come across. - Editor)

NEW PARK IN "THE HAT"

Last June, Medicine Hat opened a new natural-environment park. Situated in the South Saskatchewan Valley, Police Point Park features an interpretive centre, eight kilometres of trails, and 160 hectares of cottonwood forest. Adjacent greenspace (the river itself, a golf course, and undeveloped land) gives the impression of an even larger area.

The park lies within easy walking distance of three schools and several residential areas. The easy access resulted in over 10,000 people visiting the interpretive centre in the first four months of operation.

Visiting naturalists are encouraged to stop by the interpretive centre. To get there, follow the "River Valley Park" signs with the interpretation symbol.

In addition to exhibits and films, there is an extensive reference library relevant to the shortgrass prairie region. Chat with the interpreter, or look for the yellow-breasted chat. Either way, you'll enjoy Medicine Hat's river valley.

- Rob Gardner, Park Interpreter, Police Point Park Interpretive Centre

CANADIAN NATURE FEDERATION CONFERENCE

The Canadian Nature Federation will be holding its annual conference at Sackville, New Brunswick August 11-14, hosted by the New Brunswick Federation of Naturalists. Pre-conference activities begin Aug. 7, and include a wide range of field trips to explore the rich and rugged wild heritage of the Atlantic seaboard. Post-conference field trips are also planned, Aug. 14-18. For further details and schedules, write C.N.F. Conference 1983, R.R. 2 Mary's Point Road, Albert, N.B. EOA 1AO, or phone (506) 882-2100. This should be an exceptional conference, especially for prairie naturalists.

RARE SPECIES UPDATE

A total ban on imports of endangered African rhinoceros horns has been decreed by the government of Yemen, the world's biggest market (40%) for the poacher-supplied item (IUCN Bull. 13 (10-11-12). . . . For the first time, Burrowing Owls have produced fertile eggs in captivity at the Owl Research Foundation in Ontario, which gives hope to the survival of this vulnerable species (Equinox, Mar/Apr. 1982). . . . . California Condor eggs were successfully hatched in the U.S. this spring, following a very limited collection of eggs from wild stock. . . Norway, Peru, Japan and the U.S.S.R. filed noticed of objection to the International Whaling Commission to the phase-down moratorium on commercial whaling scheduled to commence in 1986. What is gratifying is that four whaling nations did not object: Iceland, Brazil, Spain and Korea. The whaling block is now split in half, which should surely soften the resolve of the four objectors to violate the zero quotas when they come into effect.

JUNIOR NATURALISTS' SECTION

HAPPY WOODS

Grades 3 and 4, Namao School
Teacher, S. Mullen
TUNE: HAPPY DAYS

Sparrows live in Happy Woods,
Blue Jays live in Happy Woods,
Robins live in Happy Woods,
Chickadees
In the trees
Ready to sing to you. . .

Chorus: These woods are our Happy Woods,
Share them today
These woods are our Happy Woods,
Come on and play
These woods are our Happy Woods,
Come on and play with us today,
Happy Woods!

Magpies live in Happy Woods,
Swallows live in Happy Woods,

Blue birds live in Happy Woods,
Whiskey jacks
Finding snacks,
Ready to steal from you. . . Chorus

Keep our woods a happy place,
To enjoy and not deface,
For Albertans everyplace,
Keep it clean,
Cool and green,
Ready to share with you. . . Chorus

A MOUSE TALE

A long time ago, according to a West Coast legend, the Great Spirit was sitting on a hill. His back was propped against one of the very large Douglas Fir trees that grow in British Columbia and some places in Alberta. He was thinking about the whole world, but many little mice kept bothering him. They ran all over him - over his feet, his face, through his hair.

The mice did not heed when the Great Spirit asked them to leave him alone. Finally, he lost his patience and gave the mice one last chance - to the count of three or else!

"One. . .two. . .three. . . !

The mice were very frightened and disappeared immediately. With surprise, the Great Spirit looked all around to see where they had gone. They were nowhere in sight. Then he looked up into the Douglas Fir tree. There were many cones on the tree, and there in the cones were the little mice hiding.

To this day, if you look at a Douglas Fir cone, you can still see the two hind feet and the little tail sticking out.

From "Winter Here and Now" by Joy Finlay, illustrations by Joan Heys Hawkins, published by Aspen House Productions Limited. Available through Aspen House, P.O. Box 8644, Stn. "L", Edmonton T6C 4J4, at cost, $6.95 plus postage (1-2 books, $1, 3-6, $2, more than 6, $2 plus 25¢ per copy).

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DEADLINES for submission of material for regular issues are: February 1, May ., August 1 and November 1. All maps and charts should be submitted on 8-1/2" x 11" (or 7" x 8-1/2") white bond. Please indicate in light pencil any data which are to be typed on charts, maps, etc. Black and white photographs or slides, as well as line drawings, are most welcomed. Please include your complete mailing address with submissions of material.

DEADLINES FOR F.A.N. PROJECTS ARE: Christmas Bird Counts, January 15, Virginia Young, R.R. #1, Busby, AB T0G 0H0 (674-4013); May Species Count Day, Plants, July 15, J. Derek Johnson, Northern Forest Research Centre, 5320-122 St., Edmonton AB T6H 3S5; May Species Count Day, Birds and Mammals, July 15, Al Wiseley, 202-635-56 Ave. S.W., Calgary AB T2V 0G9.

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